

[illegible]

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<222> (101)..(808)  
<223> FRXA01373
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                                     Met Glu Leu Leu Glu
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ggc tca ctg cgc acc tac cca tgg ggt tca aga aca ctg atc gct gat 163
Gly Ser Leu Arg Thr Tyr Pro Trp Gly Ser Arg Thr Leu Ile Ala Asp
          10                      15                      20

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060907Z

ctc aaa ggc gaa gaa tca cca tcg tct cgc cca gag gcc gaa gtc tgg 211
 Leu Lys Gly Glu Glu Ser Pro Ser Ser Arg Pro Glu Ala Glu Val Trp
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 ttc ggt gcc cac cca gga tca cca tca acc atc ggt gga aac gca ctc 259
 Phe Gly Ala His Pro Gly Ser Pro Ser Thr Ile Gly Gly Asn Ala Leu
 40 45 50
 aac gaa gtc atc gca gcg aac ccc gaa gaa gca ttg ggc acg cgt gtt 307
 Asn Glu Val Ile Ala Ala Asn Pro Glu Glu Ala Leu Gly Thr Arg Val
 55 60 65
 gcc gaa gcg ttt gaa aat gag ctt cca ttc ctc ctc aaa atc ctc gca 355
 Ala Glu Ala Phe Glu Asn Glu Leu Pro Phe Leu Leu Lys Ile Leu Ala
 70 75 80 85
 gcg gga gca ccc cta tca ctg cag gcc cac cca tcg ctg gaa cag gcc 403
 Ala Gly Ala Pro Leu Ser Leu Gln Ala His Pro Ser Leu Glu Gln Ala
 90 95 100
 cgt gaa gga ttc gcc cgc gaa aac tca gca gga att gac ctc ggc gca 451
 Arg Glu Gly Phe Ala Arg Glu Asn Ser Ala Gly Ile Asp Leu Gly Ala
 105 110 115
 ccg aac cgc aac tac cgc gac cca aac cac aag cca gag ctg atc gtt 499
 Pro Asn Arg Asn Tyr Arg Asp Pro Asn His Lys Pro Glu Leu Ile Val
 120 125 130
 gct ctc acg gaa ttc atc gcg atg gca ggc ttc cgc cca ctg cgg aac 547
 Ala Leu Thr Glu Phe Ile Ala Met Ala Gly Phe Arg Pro Leu Arg Asn
 135 140 145
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 Thr Leu Thr Ile Phe Asp Ala Leu Ala Cys Glu Pro Leu Asp Arg Tyr
 150 155 160 165
 cgc agc atg ctc acc gtc gac aac gag gaa gaa tcc ctc cgc gca ctg 643
 Arg Ser Met Leu Thr Val Asp Asn Glu Glu Glu Ser Leu Arg Ala Leu
 170 175 180
 ttt acc acc tgg atc acc atc ccc atc ggt aaa cga cac gaa ctc atc 691
 Phe Thr Thr Trp Ile Thr Ile Pro Ile Gly Lys Arg His Glu Leu Ile
 185 190 195
 gat gcc ctc atc agc aac gcc cac acc tac ctt gag gca agc gat cgt 739
 Asp Ala Leu Ile Ser Asn Ala His Thr Tyr Leu Glu Ala Ser Asp Arg
 200 205 210
 gac gag gac atc gca ttc gtg ctc tca cac atc atc gag ctc aac gaa 787
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<210> 358

<211> 236

<212> PRT

003290.0420960

<213> Corynebacterium glutamicum

<400> 358

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Glu Ala Glu Val Trp Phe Gly Ala His Pro Gly Ser Pro Ser Thr Ile
          35           40           45

Gly Gly Asn Ala Leu Asn Glu Val Ile Ala Ala Asn Pro Glu Glu Ala
 50           55           60

Leu Gly Thr Arg Val Ala Glu Ala Phe Glu Asn Glu Leu Pro Phe Leu
 65           70           75           80

Leu Lys Ile Leu Ala Ala Gly Ala Pro Leu Ser Leu Gln Ala His Pro
          85           90           95

Ser Leu Glu Gln Ala Arg Glu Gly Phe Ala Arg Glu Asn Ser Ala Gly
          100          105          110

Ile Asp Leu Gly Ala Pro Asn Arg Asn Tyr Arg Asp Pro Asn His Lys
          115          120          125

Pro Glu Leu Ile Val Ala Leu Thr Glu Phe Ile Ala Met Ala Gly Phe
          130          135          140

Arg Pro Leu Arg Asn Thr Leu Thr Ile Phe Asp Ala Leu Ala Cys Glu
          145          150          155          160

Pro Leu Asp Arg Tyr Arg Ser Met Leu Thr Val Asp Asn Glu Glu Glu
          165          170          175

Ser Leu Arg Ala Leu Phe Thr Thr Trp Ile Thr Ile Pro Ile Gly Lys
          180          185          190

Arg His Glu Leu Ile Asp Ala Leu Ile Ser Asn Ala His Thr Tyr Leu
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<212> DNA

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<220>

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<222> (1)..(1752)

<223> RXA02611

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002290"0420950

0960740-0630

SECRET

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gct act gtt cgc ctt gat ctt gga gcg ctt ggc tta gaa gcg ggt gca 1584
 Ala Thr Val Arg Leu Asp Leu Gly Ala Leu Gly Leu Glu Ala Gly Ala
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cag ttt gag gtg cgc gat gcg atc acc ggc tcc cgt tac ctg tgg tca 1632
 Gln Phe Glu Val Arg Asp Ala Ile Thr Gly Ser Arg Tyr Leu Trp Ser
 530 535 540

gag acg aac ttt gtc cgc ctc gag ccc cta cgc gat gtc gcc cac atc 1680
 Glu Thr Asn Phe Val Arg Leu Glu Pro Leu Arg Asp Val Ala His Ile
 545 550 555 560

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 Phe Val Leu Pro Glu Leu Pro Ala Ser Arg Arg Glu Arg Leu Ala Trp
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<212> PRT

<213> Corynebacterium glutamicum

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 20 25 30

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 35 40 45

Asp Arg Thr Ala Leu Phe Asp Val Ala Ser Ser Leu Arg Arg Gly Gly
 50 55 60

Asp Val Arg Ala Arg Leu Ala Pro Ala Leu Thr Ala Ser Val Thr His
 65 70 75 80

Leu Leu Glu Leu Asn Pro Leu Arg Glu Leu Val Thr Met Gly Glu Asn
 85 90 95

Leu Gln Val Arg Val Glu Arg Arg Ala Ala Leu Val Asn Ser Trp Tyr
 100 105 110

Glu Leu Phe Pro Arg Ser Thr Gly Gly Trp Asp Glu Ser Gly Thr Pro
 115 120 125

Val His Gly Thr Phe Ala Thr Thr Ala Gln Ala Leu Glu Arg Val Ala
 130 135 140

Lys Met Gly Phe Asp Thr Val Tyr Phe Pro Pro Ile His Pro Ile Gly
 145 150 155 160

00602740 0062300

Glu	Val	Asn	Arg	Lys 165	Gly	Arg	Asn	Asn	Thr	Leu	Thr	Pro	Glu	Pro	His
Asp	Val	Gly	Ser 180	Pro	Trp	Ala	Ile	Gly 185	Ser	Lys	Asp	Gly	Gly 190	His	Asp
Ala	Thr	His 195	Pro	Arg	Leu	Gly	Thr 200	Ile	Glu	Asp	Phe	Gln 205	Ala	Leu	Leu
Ala	Arg 210	Ala	Arg	Glu	Leu	Asn 215	Leu	Glu	Val	Ala	Leu 220	Asp	Leu	Ala	Leu
Gln 225	Ala	Ala	Pro	Asp	His 230	Pro	Trp	Ala	Gln	Glu 235	His	Arg	Glu	Phe	Phe 240
Thr	Val	Leu	Ala	Asp 245	Gly	Thr	Ile	Ala	Tyr 250	Ala	Glu	Asn	Pro	Pro 255	Lys
Lys	Tyr	Gln	Asp 260	Ile	Tyr	Pro	Ile	Asn 265	Phe	Asp	Asn	Asp	Ala 270	Pro	Lys
Ile	Tyr	Glu 275	Glu	Val	Tyr	Arg	Val 280	Val	Lys	Phe	Trp	Val 285	Asp	Leu	Gly
Val	Thr 290	Thr	Phe	Arg	Val	Asp 295	Asn	Pro	His	Thr	Lys 300	Pro	Ala	Asn	Phe
Trp 305	Gln	Trp	Leu	Ile	Ser 310	Ala	Ile	His	Lys	Ser 315	Asn	Pro	Glu	Val	Ile 320
Phe	Leu	Ala	Glu	Ala 325	Ser	Thr	Arg	Pro	Ala 330	Arg	Leu	Tyr	Phe	Leu 335	Ser
Lys	Ile	Gly	Phe 340	Ser	Gln	Ser	Tyr	Thr 345	Tyr	Phe	Thr	Trp	Lys 350	Val	Thr
Asn	Glu	Glu 355	Leu	Thr	Glu	Phe	Ala 360	Thr	Glu	Ile	Ala	Pro 365	Met	Ala	Asp
Ile	Ser 370	Arg	Pro	Asn	Leu	Phe 375	Val	Asn	Thr	Pro	Asp 380	Ile	Leu	His	Ala
Ser 385	Leu	Gln	His	Gly	Gly 390	Arg	Ala	Met	Phe	Ala 395	Ile	Arg	Ala	Ala	Leu 400
Ala	Ala	Thr	Met	Ser 405	Pro	Val	Trp	Gly	Val 410	Tyr	Ser	Gly	Tyr	Glu 415	Leu
Phe	Glu	His	Glu 420	Ala	Val	Lys	Pro	Gly 425	Ser	Glu	Glu	Tyr	Leu 430	Asp	Ser
Glu	Lys	Tyr 435	Glu	Leu	Arg	Pro	Arg 440	Asp	Phe	Glu	Gly	Ala 445	Leu	Glu	Arg
Gly	Asp 450	Ser	Leu	Glu	Asp	Tyr 455	Ile	Ala	Leu	Leu	Asn 460	Gln	Ile	Arg	Arg
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Met Thr Val Asp Pro																115
1 5																
gcg agc cac atc acc atc cct gaa gca gat ctg gcc cgc ctg cgc cac																163
Ala Ser His Ile Thr Ile Pro Glu Ala Asp Leu Ala Arg Leu Arg His																
10 15 20																
tgc aac cat cac gat cct cat gga ttt tat ggt tgg cat gag acc gaa																211
Cys Asn His His Asp Pro His Gly Phe Tyr Gly Trp His Glu Thr Glu																
25 30 35																
gct ggt tcg gtt atc cgc acg cgc cag gtc ggc gcg acg cag gtt aat																259
Ala Gly Ser Val Ile Arg Thr Arg Gln Val Gly Ala Thr Gln Val Asn																
40 45 50																
ttg ctt atc gac gac acc tcc cac gtc atg acc cct atc ggc gac gac																307
Leu Leu Ile Asp Asp Thr Ser His Val Met Thr Pro Ile Gly Asp Asp																
55 60 65																
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Ile Phe Ala Ile Asp Leu Gly His Arg Glu Arg Ala Asp Tyr Arg Leu																
70 75 80 85																
gaa gtc acc tgg cct gat caa gaa ccg cag gtc aag gct gat cca tac																403
Glu Val Thr Trp Pro Asp Gln Glu Pro Gln Val Lys Ala Asp Pro Tyr																

gaa gtc acc tgg cct gat caa gaa ccg cag gtc aag gct gat cca tac 403
Glu Val Thr Trp Pro Asp Gln Glu Pro Gln Val Lys Ala Asp Pro Tyr

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gcc ctc tat gaa cac cct gac tgg agg cgc ggc gaa caa aag gat tgg	1219
Ala Leu Tyr Glu His Pro Asp Trp Arg Arg Gly Glu Gln Lys Asp Trp	
360 365 370	
ggc acc ctg gtc ttt gac ttc ggt cgc aac gaa gtc cgc aac ttc ctc	1267
Gly Thr Leu Val Phe Asp Phe Gly Arg Asn Glu Val Arg Asn Phe Leu	
375 380 385	
gtc gct aat gcg ttg tac tgg att gaa gaa ttc cac atc gat ggt ctg	1315
Val Ala Asn Ala Leu Tyr Trp Ile Glu Glu Phe His Ile Asp Gly Leu	
390 395 400 405	
cgc gtc gac gcc gtg gcc tcc atg ctg tac ctc gat tac tcc cgt gag	1363
Arg Val Asp Ala Val Ala Ser Met Leu Tyr Leu Asp Tyr Ser Arg Glu	
410 415 420	
cac ggc gaa tgg gaa cca aac atc tac ggt ggt cgc gag aac ctc gag	1411
His Gly Glu Trp Glu Pro Asn Ile Tyr Gly Gly Arg Glu Asn Leu Glu	
425 430 435	
gca gtg cag ttc ctg cag gaa atg aac gcc acg gtg ctg cga ctg cac	1459
Ala Val Gln Phe Leu Gln Glu Met Asn Ala Thr Val Leu Arg Leu His	
440 445 450	
cct ggt gcg ctc acc atc gct gag gaa tca act tca tgg cct ggc gtg	1507
Pro Gly Ala Leu Thr Ile Ala Glu Glu Ser Thr Ser Trp Pro Gly Val	
455 460 465	
acc gca cca acg tgg gac ggc ggc ttg gga ttc tcc ctc aag tgg aac	1555
Thr Ala Pro Thr Trp Asp Gly Gly Leu Gly Phe Ser Leu Lys Trp Asn	
470 475 480 485	
atg ggc tgg atg cac gac acc tta gag tac ttc tcc aaa aac cct gtg	1603
Met Gly Trp Met His Asp Thr Leu Glu Tyr Phe Ser Lys Asn Pro Val	
490 495 500	
cac cgc gca ttc cac cac agt gag ctc act ttc tcc ttg gtg tac gca	1651
His Arg Ala Phe His His Ser Glu Leu Thr Phe Ser Leu Val Tyr Ala	
505 510 515	
ttc tct gag cgt ttt gta ctt ccg atc tct cac gat gaa gtc gtc cac	1699
Phe Ser Glu Arg Phe Val Leu Pro Ile Ser His Asp Glu Val Val His	
520 525 530	
ggc aag ggt tcc ctg tgg gac cgt atg cct ggc gat acg tgg aac aag	1747
Gly Lys Gly Ser Leu Trp Asp Arg Met Pro Gly Asp Thr Trp Asn Lys	
535 540 545	
gcc gct ggt ctt cgc acc ttc ctt gcg tac atg tgg tca cac cca ggc	1795
Ala Ala Gly Leu Arg Thr Phe Leu Ala Tyr Met Trp Ser His Pro Gly	
550 555 560 565	
aag aag ctg ctt ttc atg ggt cag gag ttt ggt cag cgt gaa gag tgg	1843
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09602740 062300

<400> 362

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			20					25					30		
Trp	His	Glu	Thr	Glu	Ala	Gly	Ser	Val	Ile	Arg	Thr	Arg	Gln	Val	Gly
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Ala	Thr	Gln	Val	Asn	Leu	Leu	Ile	Asp	Asp	Thr	Ser	His	Val	Met	Thr
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Pro	Ile	Gly	Asp	Asp	Ile	Phe	Ala	Ile	Asp	Leu	Gly	His	Arg	Glu	Arg
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 Lys Ala Asp Pro Tyr Tyr Phe Leu Pro Thr Val Gly Glu Met Asp Ile
 100 105 110
 Tyr Leu Phe Ser Glu Gly Arg His Glu Arg Leu Trp Glu Ile Leu Gly
 115 120 125
 Ala Asn Ile Lys Thr Tyr Gln Thr Ala Leu Gly Thr Val Arg Gly Thr
 130 135 140
 Ala Phe Thr Val Trp Ala Pro Asn Ala Ile Gly Cys Ala Val Val Gly
 145 150 155 160
 Gly Phe Asn Gly Trp Asn Ala Ser Gln His Pro Met Arg Ser Met Gly
 165 170 175
 Gly Ser Gly Leu Trp Glu Leu Phe Ile Pro Gly Ile Glu Glu Gly Glu
 180 185 190
 Val Tyr Lys Phe Ala Val Gln Thr Arg Glu Gly Gln Arg Arg Asp Lys
 195 200 205
 Ala Asp Pro Met Ala Arg Arg Ala Glu Leu Ala Pro Ala Thr Gly Ser
 210 215 220
 Ile Val Ala Ser Ser Glu Tyr Gln Trp Gln Asp Ser Glu Trp Leu Arg
 225 230 235 240
 Glu Arg Ser Gln Thr Asp Leu Ala Ser Lys Pro Met Ser Val Tyr Glu
 245 250 255
 Val His Leu Gly Ser Trp Arg Trp Gly Lys Asn Tyr Glu Asp Leu Ala
 260 265 270
 Thr Glu Leu Val Asp Tyr Val Ala Asp Leu Gly Tyr Thr His Val Glu
 275 280 285
 Phe Leu Pro Val Ala Glu His Pro Phe Gly Gly Ser Trp Gly Tyr Gln
 290 295 300
 Val Thr Gly Tyr Tyr Ala Pro Thr Ser Arg Trp Gly Thr Pro Asp Gln
 305 310 315 320
 Phe Arg Ala Leu Val Asp Ala Phe His Ala Arg Gly Ile Gly Val Ile
 325 330 335
 Met Asp Trp Val Pro Ala His Phe Pro Lys Asp Asp Trp Ala Leu Ala
 340 345 350
 Arg Phe Asp Gly Glu Ala Leu Tyr Glu His Pro Asp Trp Arg Arg Gly
 355 360 365
 Glu Gln Lys Asp Trp Gly Thr Leu Val Phe Asp Phe Gly Arg Asn Glu
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 Val Arg Asn Phe Leu Val Ala Asn Ala Leu Tyr Trp Ile Glu Glu Phe
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002290"0420950

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730

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<223> RXN01884
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Arg	Leu	Arg	Asp	Leu	Gly	Met	Arg	Asn	Tyr	Trp	Gly	Tyr	Asn	Ser	Phe	
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Gly	Leu	Glu	Val	Ile	Leu	Asp	Val	Val	Tyr	Asn	His	Thr	Ala	Glu	Gly	
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Asn	His	Met	Gly	Pro	Thr	Ile	Ala	Phe	Arg	Gly	Ile	Asp	Asn	Glu	Ala	
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Tyr	Tyr	Arg	Leu	Val	Glu	Gly	Asp	Arg	Arg	His	Tyr	Met	Asp	Tyr	Thr	
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ggt	act	ggt	aac	tcc	ctc	aat	gtc	cg	gac	ccg	cac	tca	ctg	cag	ctg	384
Gly	Thr	Gly	Asn	Ser	Leu	Asn	Val	Arg	Asp	Pro	His	Ser	Leu	Gln	Leu	
115					120						125					
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Ile	Met	Asp	Ser	Leu	Arg	Tyr	Trp	Val	Thr	Glu	Met	His	Val	Asp	Gly	
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Phe	Arg	Phe	Asp	Leu	Ala	Ser	Thr	Leu	Ala	Arg	Glu	Phe	Asp	Asp	Val	
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Asp	Arg	Leu	Ala	Thr	Phe	Phe	Asp	Leu	Val	Gln	Gln	Asp	Pro	Val	Val	
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tcc	cag	gtc	aag	ctc	att	gct	gag	ccg	tgg	gat	gtt	ggc	gaa	ggc	gga	576
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 355 360 365
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 370 375 380
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 385 390 395 400
 Trp Leu Val Pro Asn Gly Thr Leu Met Thr Gln Asp Asp Trp Asp Phe
 405 410 415
 Ala Phe Gly Lys Ser Leu Gln Val Phe Phe Asn Gly Asp Ala Ile Glu
 420 425 430
 Glu Pro Asp Tyr Arg Gly Gln Lys Ile His Asp Asp Ser Phe Ile Leu
 435 440 445
 Met Phe Asn Ala His Phe Glu Pro Ile Asp Phe Asn Leu Pro Pro Glu
 450 455 460
 His Phe Gly Met Lys Trp Lys Leu Leu Val Asp Thr Thr Glu Ala Val
 465 470 475 480
 Gly His Pro Leu Glu Asp Leu Thr Ile Glu Ala Gly Gly Thr Ile Thr
 485 490 495
 Val Pro Ala Arg Ser Thr Met Leu Leu Arg Gln Val Glu Ala Pro Asp
 500 505 510
 Tyr Thr Lys Leu Glu Glu Lys Ile Ala Ala Glu Lys Arg Glu Gln Glu
 515 520 525
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 530 535 540
 Ala Ala Lys Glu Ala Glu Asp Ala Ala Glu Ala Leu His Leu Ala Ala
 545 550 555 560
 Glu Arg Ala Ser Thr Gln Glu Ala Glu Leu Ala His Gln His Gly Ala
 565 570 575
 Asp Ala Ile Ala Asp Glu Val Ala Glu Glu Pro Gln Glu Leu Pro Gln
 580 585 590
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<212> DNA

0062740.062340


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<223> FRXA01884
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gaa Glu	ttt Phe	gat Asp	gat Asp 20	gtt Val	gac Asp	cgc Arg	ctg Leu	gca Ala 25	acc Thr	ttc Phe	ttc Phe	gac Asp	ctg Leu 30	gtc Val	caa Gln	96
caa Gln	gac Asp	ccg Pro 35	gtg Val	gtc Val	tcc Ser	cag Gln	gtc Val 40	aag Lys	ctc Leu	att Ile	gct Ala	gag Glu 45	ccg Pro	tgg Trp	gat Asp	144
gtt Val	ggc Gly 50	gaa Glu	ggc Gly	gga Gly	tac Tyr	caa Gln 55	gtg Val	ggc Gly	aac Asn	ttc Phe	cca Pro 60	cca Pro	ctg Leu	tgg Trp	act Thr	192
gag Glu 65	tgg Trp	aac Asn	ggc Gly	aaa Lys	tac Tyr 70	cgc Arg	gac Asp	act Thr	gtc Val	cgt Arg 75	gat Asp	ttc Phe	tgg Trp	cgt Arg	ggc Gly 80	240
gag Glu	cca Pro	gca Ala	acc Thr	ttg Leu 85	ggc Gly	gaa Glu	ttc Phe	gct Ala	tcc Ser 90	cga Arg	cta Leu	act Thr	ggc Gly	tcc Ser 95	tct Ser	288
gat Asp	ttg Leu	tat Tyr	gca Ala 100	aac Asn	aac Asn	ggc Gly	cgt Arg	cgc Arg 105	ccc Pro	act Thr	gca Ala	tgc Ser	atc Ile 110	aac Asn	ttt Phe	336
gtg Val	act Thr	gct Ala 115	cac His	gac Asp	ggc Gly	ttc Phe	acc Thr 120	ctc Leu	aat Asn	gac Asp	ttg Leu	gtc Val 125	agt Ser	tac Tyr	aac Asn	384
gag Glu	aag Lys 130	cac His	aac Asn	atg Met	gcc Ala	aac Asn 135	ggc Gly	gaa Glu	gac Asp	ggc Gly	cgg Arg 140	gac Asp	ggc Gly	gaa Glu	tca Ser	432
cac His 145	aac Asn	cgt Arg	tcc Ser	tgg Trp	aac Asn 150	tgt Cys	ggc Gly	gtc Val	gaa Glu	gga Gly 155	cca Pro	act Thr	gac Asp	gat Asp	cct Pro 160	480
gag Glu	att Ile	atg Met	cag Gln	ctg Leu 165	cgt Arg	gct Ala	cag Gln	caa Gln	cga Arg 170	cgc Arg	aac Asn	ttc Phe	ctc Leu	acc Thr 175	acc Thr	528
ttg Leu	ttg Leu	ctg Leu	tcc Ser 180	cag Gln	ggc Gly	acc Thr	cct Pro	atg Met 185	ttg Leu	tcc Ser	cac His	ggc Gly	gat Asp 190	gaa Glu	atg Met	576
gcc Ala	cgt Arg	acc Thr 195	caa Gln	aac Asn	ggc Gly	aac Asn	aac Asn 200	aac Asn	gtc Val	tac Tyr	tgc Cys	caa Gln 205	gac Asp	aat Asn	gaa Glu	624
ctg	gcg	tgg	gtg	aat	tgg	gat	cag	gct	gaa	gaa	aac	gct	gac	ttg	gtg	672

[illegible]

Leu	Ala	Trp	Val	Asn	Trp	Asp	Gln	Ala	Glu	Glu	Asn	Ala	Asp	Leu	Val		
210						215					220						
agc	ttc	acc	agg	cgt	ttg	ctg	cgt	atc	cga	gca	aac	cac	cca	gta	ttt	720	
Ser	Phe	Thr	Arg	Arg	Leu	Leu	Arg	Ile	Arg	Ala	Asn	His	Pro	Val	Phe		
225					230					235					240		
agg	cgc	agg	cag	ttc	ctt	gcc	ggg	ggc	cct	ttg	ggc	gcc	gat	gtt	cgt	768	
Arg	Arg	Arg	Gln	Phe	Leu	Ala	Gly	Gly	Pro	Leu	Gly	Ala	Asp	Val	Arg		
				245					250					255			
gac	cgc	gat	atc	gca	tgg	ctg	gta	cca	aat	gga	acc	ttg	atg	act	caa	816	
Asp	Arg	Asp	Ile	Ala	Trp	Leu	Val	Pro	Asn	Gly	Thr	Leu	Met	Thr	Gln		
			260					265					270				
gat	gac	tgg	gac	ttc	gct	ttc	ggg	aaa	tca	ctg	cag	gtg	ttc	ttc	aac	864	
Asp	Asp	Trp	Asp	Phe	Ala	Phe	Gly	Lys	Ser	Leu	Gln	Val	Phe	Phe	Asn		
		275					280					285					
ggc	gat	gcc	atc	gaa	gag	cct	gat	tat	cga	gga	cag	aaa	atc	cac	gat	912	
Gly	Asp	Ala	Ile	Glu	Glu	Pro	Asp	Tyr	Arg	Gly	Gln	Lys	Ile	His	Asp		
	290					295					300						
gac	tcc	ttc	atc	ttg	atg	ttc	aac	gct	cac	ttc	gaa	cct	atc	gat	ttc	960	
Asp	Ser	Phe	Ile	Leu	Met	Phe	Asn	Ala	His	Phe	Glu	Pro	Ile	Asp	Phe		
305					310					315					320		
aat	ctc	cct	cct	gag	cat	ttc	ggg	atg	aag	tgg	aag	ctt	ttg	gtc	gat	1008	
Asn	Leu	Pro	Pro	Glu	His	Phe	Gly	Met	Lys	Trp	Lys	Leu	Leu	Val	Asp		
				325					330					335			
acc	acc	gaa	gcg	gtg	ggc	cac	ccg	ctg	gag	gat	ctc	acc	atc	gaa	gct	1056	
Thr	Thr	Glu	Ala	Val	Gly	His	Pro	Leu	Glu	Asp	Leu	Thr	Ile	Glu	Ala		
			340					345					350				
ggc	gga	acc	atc	act	gtt	cct	gcc	cgt	tcc	acg	atg	ctg	ctg	cgc	cag	1104	
Gly	Gly	Thr	Ile	Thr	Val	Pro	Ala	Arg	Ser	Thr	Met	Leu	Leu	Arg	Gln		
		355					360					365					
gtg	gag	gct	ccg	gac	tac	acc	aag	ctt	gag	gaa	aag	atc	gct	gct	gaa	1152	
Val	Glu	Ala	Pro	Asp	Tyr	Thr	Lys	Leu	Glu	Glu	Lys	Ile	Ala	Ala	Glu		
	370					375					380						
aag	cgt	gag	caa	gaa	ctt	gcg	gca	gag	aag	gaa	gct	gct	gag	aag	cgc	1200	
Lys	Arg	Glu	Gln	Glu	Leu	Ala	Ala	Glu	Lys	Glu	Ala	Ala	Glu	Lys	Arg		
385					390					395					400		
gaa	ttg	gaa	ctg	gcg	gca	gca	aag	gaa	gct	gaa	gat	gct	gct	gag	gct	1248	
Glu	Leu	Glu	Leu	Ala	Ala	Ala	Lys	Glu	Ala	Glu	Asp	Ala	Ala	Glu	Ala		
				405				410						415			
ctc	cac	ctt	gcg	gca	gaa	cgt	gct	tcg	act	cag	gaa	gct	gaa	ttg	gcc	1296	
Leu	His	Leu	Ala	Ala	Glu	Arg	Ala	Ser	Thr	Gln	Glu	Ala	Glu	Leu	Ala		
			420					425					430				
cat	caa	cac	ggg	gct	gat	gcg	att	gcc	gat	gag	gta	gcg	gaa	gaa	cca	1344	
His	Gln	His	Gly	Ala	Asp	Ala	Ile	Ala	Asp	Glu	Val	Ala	Glu	Glu	Pro		
		435					440					445					
caa	gag	ctg	cca	caa	gat	gaa	gta	gcg	gca	gag	gtc	gag	act	gag	ccc	1392	
Gln	Glu	Leu	Pro	Gln	Asp	Glu	Val	Ala	Ala	Glu	Val	Glu	Thr	Glu	Pro		

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<400> 366															
Met 1	His	Val	Asp	Gly 5	Phe	Arg	Phe	Asp	Leu 10	Ala	Ser	Thr	Leu	Ala 15	Arg
Glu	Phe	Asp	Asp 20	Val	Asp	Arg	Leu	Ala 25	Thr	Phe	Phe	Asp	Leu 30	Val	Gln
Gln	Asp	Pro 35	Val	Val	Ser	Gln	Val 40	Lys	Leu	Ile	Ala	Glu 45	Pro	Trp	Asp
Val	Gly 50	Glu	Gly	Gly	Tyr	Gln 55	Val	Gly	Asn	Phe	Pro 60	Pro	Leu	Trp	Thr
Glu 65	Trp	Asn	Gly	Lys	Tyr 70	Arg	Asp	Thr	Val	Arg 75	Asp	Phe	Trp	Arg	Gly 80
Glu	Pro	Ala	Thr	Leu 85	Gly	Glu	Phe	Ala	Ser 90	Arg	Leu	Thr	Gly	Ser 95	Ser
Asp	Leu	Tyr	Ala 100	Asn	Asn	Gly	Arg	Arg 105	Pro	Thr	Ala	Ser	Ile 110	Asn	Phe
Val	Thr	Ala 115	His	Asp	Gly	Phe	Thr 120	Leu	Asn	Asp	Leu	Val 125	Ser	Tyr	Asn
Glu	Lys 130	His	Asn	Met	Ala	Asn 135	Gly	Glu	Asp	Gly	Arg 140	Asp	Gly	Glu	Ser
His 145	Asn	Arg	Ser	Trp	Asn 150	Cys	Gly	Val	Glu	Gly 155	Pro	Thr	Asp	Asp	Pro 160
Glu	Ile	Met	Gln	Leu 165	Arg	Ala	Gln	Gln	Arg 170	Arg	Asn	Phe	Leu	Thr 175	Thr
Leu	Leu	Leu	Ser 180	Gln	Gly	Thr	Pro	Met 185	Leu	Ser	His	Gly	Asp 190	Glu	Met
Ala	Arg	Thr 195	Gln	Asn	Gly	Asn	Asn 200	Asn	Val	Tyr	Cys	Gln 205	Asp	Asn	Glu
Leu	Ala 210	Trp	Val	Asn	Trp	Asp 215	Gln	Ala	Glu	Glu	Asn 220	Ala	Asp	Leu	Val

Figure 1 displays 12 histograms, labeled $k=0$ through $k=11$, showing the distribution of the number of non-zero elements in the rows of the matrix A_k . The x-axis for each histogram represents the number of non-zero elements (ranging from 0 to 100), and the y-axis represents the frequency of rows with that number of non-zero elements. The distributions are roughly bell-shaped and centered around 50 non-zero elements per row.

Ser Phe Thr Arg Arg Leu Leu Arg Ile Arg Ala Asn His Pro Val Phe
 225 230 235 240
 Arg Arg Arg Gln Phe Leu Ala Gly Gly Pro Leu Gly Ala Asp Val Arg
 245 250 255
 Asp Arg Asp Ile Ala Trp Leu Val Pro Asn Gly Thr Leu Met Thr Gln
 260 265 270
 Asp Asp Trp Asp Phe Ala Phe Gly Lys Ser Leu Gln Val Phe Phe Asn
 275 280 285
 Gly Asp Ala Ile Glu Glu Pro Asp Tyr Arg Gly Gln Lys Ile His Asp
 290 295 300
 Asp Ser Phe Ile Leu Met Phe Asn Ala His Phe Glu Pro Ile Asp Phe
 305 310 315 320
 Asn Leu Pro Pro Glu His Phe Gly Met Lys Trp Lys Leu Leu Val Asp
 325 330 335
 Thr Thr Glu Ala Val Gly His Pro Leu Glu Asp Leu Thr Ile Glu Ala
 340 345 350
 Gly Gly Thr Ile Thr Val Pro Ala Arg Ser Thr Met Leu Leu Arg Gln
 355 360 365
 Val Glu Ala Pro Asp Tyr Thr Lys Leu Glu Glu Lys Ile Ala Ala Glu
 370 375 380
 Lys Arg Glu Gln Glu Leu Ala Ala Glu Lys Glu Ala Ala Glu Lys Arg
 385 390 395 400
 Glu Leu Glu Leu Ala Ala Ala Lys Glu Ala Glu Asp Ala Ala Glu Ala
 405 410 415
 Leu His Leu Ala Ala Glu Arg Ala Ser Thr Gln Glu Ala Glu Leu Ala
 420 425 430
 His Gln His Gly Ala Asp Ala Ile Ala Asp Glu Val Ala Glu Glu Pro
 435 440 445
 Gln Glu Leu Pro Gln Asp Glu Val Ala Ala Glu Val Glu Thr Glu Pro
 450 455 460
 Asp Thr Glu Pro Asp Thr Glu Ser Asp Ser Glu Gln Ala Glu Val Ala
 465 470 475 480
 Ser Glu Glu Pro Glu Ala Asp Glu Glu Glu Lys
 485 490

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<211> 547

<212> DNA

<213> Corynebacterium glutamicum

<220>

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<222> (101)..(547)

<223> RXA01111

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gag cac tcg tac caa gtt tgg cct gga cat gct tat cct ctg ggt tca 163
Glu His Ser Tyr Gln Val Trp Pro Gly His Ala Tyr Pro Leu Gly Ser
10 15 20

acc tat gac ggt gct gga acg aac ttc gca ctc ttc tcc gac gtt gca 211
Thr Tyr Asp Gly Ala Gly Thr Asn Phe Ala Leu Phe Ser Asp Val Ala
25 30 35

gag cgt gtt gag ctg tgt cta tta gat gca gat aac aac gag act cga 259
Glu Arg Val Glu Leu Cys Leu Leu Asp Ala Asp Asn Asn Glu Thr Arg
40 45 50

att cca ctc gaa gag cgc gat gcc cac att tgg cat tgc tac ctt cct 307
Ile Pro Leu Glu Glu Arg Asp Ala His Ile Trp His Cys Tyr Leu Pro
55 60 65

ggc gtt caa cct gga cag cgc tac gga ttc cga gtt cat ggc ccg tgg 355
Gly Val Gln Pro Gly Gln Arg Tyr Gly Phe Arg Val His Gly Pro Trp
70 75 80 85

aac cca gat gag ggt aag cgg tgc gac gcg aac aaa ctt cta gtt gat 403
Asn Pro Asp Glu Gly Lys Arg Cys Asp Ala Asn Lys Leu Leu Val Asp
90 95 100

ccc tat gct cgt gct ttc gat gga gat ttt gat gga cat ccg tca cta 451
Pro Tyr Ala Arg Ala Phe Asp Gly Asp Phe Asp Gly His Pro Ser Leu
105 110 115

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ttt tct tac gac atc acc aat cca aat gac ccc aac ggt cgc aat acc    499
Phe Ser Tyr Asp Ile Thr Asn Pro Asn Asp Pro Asn Gly Arg Asn Thr
      120                      125                      130

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gaa gac agc att gat cac aca atg aag tct gtc gtg gtg aac cca ttc 547
Glu Asp Ser Ile Asp His Thr Met Lys Ser Val Val Val Asn Pro Phe
135 140 145

<210> 368

<211> 149

<212> PRT

<213> Corynebacterium glutamicum

<400> 368

Met Thr Ser Thr Ile Glu His Ser Tyr Gln Val Trp Pro Gly His Ala
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Tyr Pro Leu Gly Ser Thr Tyr Asp Gly Ala Gly Thr Asn Phe Ala Leu
20 25 30

Phe Ser Asp Val Ala Glu Arg Val Glu Leu Cys Leu Leu Asp Ala Asp
35 40 45

Asn Asn Glu Thr Arg Ile Pro Leu Glu Glu Arg Asp Ala His Ile Trp

112

[illegible]

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<222> (101)..(1612)
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cgaccacaa ggacctcagc aactttgccg agttcactcc gtg cag ctc aat gac 115
Val Gln Leu Asn Asp
1 5

act cac cca gtg ttg gct atc cct gag ctt atg cgt ctg ctc atg gac 163
Thr His Pro Val Leu Ala Ile Pro Glu Leu Met Arg Leu Leu Met Asp
10 15 20

gag cat gac atg ggc tgg gaa gaa tcc tgg gca atc gtg ttc aag acc 211
Glu His Asp Met Gly Trp Glu Glu Ser Trp Ala Ile Val Phe Lys Thr
25 30 35

ttc gca tac acc aac cac acc gtg ctc acc gaa gct ctt gag cag tgg 259
Phe Ala Tyr Thr Asn His Thr Val Leu Thr Glu Ala Leu Glu Gln Trp
 40 45 50

gat cag cag atc ttc caa cag ctg ttc tgg cgc gtg tgg gaa atc atc 307
Asp Gln Gln Ile Phe Gln Gln Leu Phe Trp Arg Val Trp Glu Ile Ile
55 60 65

aca gag atc gat cgc cgc ttc cgt ttg gag cgc gca gcc gat gga ctg 355
Thr Glu Ile Asp Arg Arg Phe Arg Leu Glu Arg Ala Ala Asp Gly Leu
70 75 80 85

gat gaa gag acc atc gac cgc atg gct cca atc cag cac ggc act gtt 403
Asp Glu Glu Thr Ile Asp Arg Met Ala Pro Ile Gln His Gly Thr Val
90 95 100

[illegible]

[illegible]

atg Met	aag Lys	ttc Phe	atg Met	atg Met	aac Asn	ggc Gly	gcc Ala	ctc Leu	acc Thr	ctg Leu	ggc Gly	acc Thr	atg Met	gac Asp	ggc Gly	1171		
345																350	355	
gcc Ala	aac Asn	gta Val	gag Glu	atc Ile	gtg Val	gat Asp	tct Ser	gtg Val	ggc Gly	gag Glu	gaa Glu	aac Asn	gcc Ala	tat Tyr	atc Ile	1219		
360																365	370	
ttc Phe	ggg Gly	gct Ala	cgc Arg	gtg Val	gaa Glu	gaa Glu	ttg Leu	cca Pro	gcc Ala	ctg Leu	cgc Arg	gaa Glu	agc Ser	tac Tyr	gag Glu	1267		
375																380	385	
cca Pro	tat Tyr	gag Glu	ctc Leu	tat Tyr	gag Glu	acc Thr	gtc Val	cct Pro	ggc Gly	ctc Leu	aag Lys	cgc Arg	gca Ala	ttg Leu	gac Asp	1315		
390																395	400	405
gcc Ala	ctg Leu	gat Asp	aac Asn	ggc Gly	acc Thr	ctc Leu	aac Asn	gac Asp	aac Asn	aac Asn	agt Ser	ggg Gly	ttg Leu	ttc Phe	tac Tyr	1363		
410																415	420	
gac Asp	ctc Leu	aag Lys	cat His	tcc Ser	ttg Leu	atc Ile	cac His	ggg Gly	tat Tyr	gga Gly	aaa Lys	gac Asp	gcc Ala	agc Ser	gac Asp	1411		
425																430	435	
acc Thr	tac Tyr	tac Tyr	gtg Val	ctt Leu	ggc Gly	gat Asp	ttc Phe	gca Ala	gat Asp	tac Tyr	cgc Arg	gag Glu	acc Thr	cgc Arg	gac Asp	1459		
440																445	450	
cgt Arg	atg Met	gcc Ala	gcc Ala	gac Asp	tac Tyr	gcc Ala	tcc Ser	gat Asp	ccc Pro	ctg Leu	ggg Gly	tgg Trp	gca Ala	cgc Arg	atg Met	1507		
455																460	465	
gcc Ala	tgg Trp	atc Ile	aac Asn	att Ile	tgc Cys	gag Glu	tcc Ser	ggc Gly	cgt Arg	ttc Phe	tcc Ser	tcc Ser	gac Asp	cgc Arg	acc Thr	1555		
470																475	480	485
atc Ile	cgc Arg	gat Asp	tat Tyr	gcc Ala	acc Thr	gag Glu	atc Ile	tgg Trp	aag Lys	ctc Leu	gag Glu	cca Pro	act Thr	cct Pro	gct Ala	1603		
490																495	500	
gtt Val	aag Lys	aag Lys	taggttttaa cctccgcttc taa													1635		

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20 25 30
Ile Val Phe Lys Thr Phe Ala Tyr Thr Asn His Thr Val Leu Thr Glu
35 40 45
Ala Leu Glu Gln Trp Asp Gln Gln Ile Phe Gln Gln Leu Phe Trp Arg

50					55					60					
Val	Trp	Glu	Ile	Ile	Thr	Glu	Ile	Asp	Arg	Arg	Phe	Arg	Leu	Glu	Arg
65					70					75					80
Ala	Ala	Asp	Gly	Leu	Asp	Glu	Glu	Thr	Ile	Asp	Arg	Met	Ala	Pro	Ile
				85					90					95	
Gln	His	Gly	Thr	Val	His	Met	Ala	Trp	Ile	Ala	Cys	Tyr	Ala	Ala	Tyr
			100					105					110		
Ser	Ile	Asn	Gly	Val	Ala	Ala	Leu	His	Thr	Glu	Ile	Ile	Lys	Ala	Glu
		115					120					125			
Thr	Leu	Ala	Asp	Trp	Tyr	Ala	Leu	Trp	Pro	Glu	Lys	Phe	Asn	Asn	Lys
	130					135					140				
Thr	Asn	Gly	Val	Thr	Pro	Arg	Arg	Trp	Leu	Arg	Met	Ile	Asn	Pro	Gly
145					150					155					160
Leu	Ser	Asp	Leu	Leu	Thr	Arg	Leu	Ser	Gly	Ser	Asp	Asp	Trp	Val	Thr
				165					170					175	
Asp	Leu	Asp	Glu	Leu	Lys	Lys	Leu	Arg	Ser	Tyr	Ala	Asp	Asp	Lys	Ser
			180					185					190		
Val	Leu	Glu	Glu	Leu	Arg	Ala	Ile	Lys	Ala	Ala	Asn	Lys	Gln	Asp	Phe
		195					200					205			
Ala	Glu	Trp	Ile	Leu	Glu	Arg	Gln	Gly	Ile	Glu	Ile	Asp	Pro	Glu	Ser
	210					215					220				
Ile	Phe	Asp	Val	Gln	Ile	Lys	Arg	Leu	His	Glu	Tyr	Lys	Arg	Gln	Leu
225					230					235					240
Met	Asn	Ala	Leu	Tyr	Val	Leu	Asp	Leu	Tyr	Phe	Arg	Ile	Lys	Glu	Asp
				245					250					255	
Gly	Leu	Thr	Asp	Ile	Pro	Ala	Arg	Thr	Val	Ile	Phe	Gly	Ala	Lys	Ala
			260					265					270		
Ala	Pro	Gly	Tyr	Val	Arg	Ala	Lys	Ala	Ile	Ile	Lys	Leu	Ile	Asn	Ser
		275					280					285			
Ile	Ala	Asp	Leu	Val	Asn	Asn	Asp	Pro	Glu	Val	Ser	Pro	Leu	Leu	Lys
	290					295					300				
Val	Val	Phe	Val	Glu	Asn	Tyr	Asn	Val	Ser	Pro	Ala	Glu	His	Ile	Leu
305					310					315					320
Pro	Ala	Ser	Asp	Val	Ser	Glu	Gln	Ile	Ser	Thr	Ala	Gly	Lys	Glu	Ala
				325					330					335	
Ser	Gly	Thr	Ser	Asn	Met	Lys	Phe	Met	Met	Asn	Gly	Ala	Leu	Thr	Leu
			340					345					350		
Gly	Thr	Met	Asp	Gly	Ala	Asn	Val	Glu	Ile	Val	Asp	Ser	Val	Gly	Glu
	355						360					365			
Glu	Asn	Ala	Tyr	Ile	Phe	Gly	Ala	Arg	Val	Glu	Glu	Leu	Pro	Ala	Leu
	370					375					380				

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Leu Tyr Glu Thr Val Pro Gly Leu Lys Arg Ala Leu Asp Ala Leu Asp
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 aac ggc acc ctc aac gac aac aac agt ggt ttg ttc tac gac ctc aag 1104
 Asn Gly Thr Leu Asn Asp Asn Asn Ser Gly Leu Phe Tyr Asp Leu Lys
 355 360 365
 cat tcc ttg atc cac ggt tat gga aaa gac gcc agc gac acc tac tac 1152
 His Ser Leu Ile His Gly Tyr Gly Lys Asp Ala Ser Asp Thr Tyr Tyr
 370 375 380
 gtg ctt ggc gat ttc gca gat tac cgc gag acc cgc gac cgt atg gcc 1200
 Val Leu Gly Asp Phe Ala Asp Tyr Arg Glu Thr Arg Asp Arg Met Ala
 385 390 395 400
 gcc gac tac gcc tcc gat ccc ctg ggt tgg gca cgc atg gcc tgg atc 1248
 Ala Asp Tyr Ala Ser Asp Pro Leu Gly Trp Ala Arg Met Ala Trp Ile
 405 410 415
 aac att tgc gag tcc ggc cgt ttc tcc tcc gac cgc acc atc cgc gat 1296
 Asn Ile Cys Glu Ser Gly Arg Phe Ser Ser Asp Arg Thr Ile Arg Asp
 420 425 430
 tat gcc acc gag atc tgg aag ctc gag cca act cct gct gtt aag aag 1344
 Tyr Ala Thr Glu Ile Trp Lys Leu Glu Pro Thr Pro Ala Val Lys Lys
 435 440 445
 taggttttaa cctccgcttc taa 1367

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 20 25 30
 Thr Ile Asp Arg Met Ala Pro Ile Gln Arg Gly Thr Val His Met Ala
 35 40 45
 Trp Ile Ala Cys Tyr Ala Ala Tyr Ser Ile Asn Gly Val Ala Ala Leu
 50 55 60
 His Thr Glu Ile Ile Lys Ala Glu Thr Leu Ala Asp Trp Tyr Ala Leu
 65 70 75 80
 Trp Pro Glu Lys Phe Asn Asn Lys Thr Asn Gly Val Thr Pro Arg Arg
 85 90 95
 Trp Leu Arg Met Ile Asn Pro Gly Leu Ser Asp Leu Leu Thr Arg Leu
 100 105 110
 Ser Gly Ser Asp Asp Trp Val Thr Asp Leu Asp Glu Leu Lys Lys Leu
 115 120 125
 Arg Ser Tyr Ala Asp Asp Lys Ser Val Leu Glu Glu Leu Arg Ala Ile

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0960240-0930

<210> 373
 <211> 2348
 <212> DNA
 <213> Corynebacterium glutamicum

<220>
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 <222> (1)..(2325)
 <223> RXN02100

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 gac aag ctg tgg tac cag gac acc gca gat gca acc gat gct gtc gga 96
 Asp Lys Leu Trp Tyr Gln Asp Thr Ala Asp Ala Thr Asp Ala Val Gly
 20 25 30
 gat cca ctc gtt gcg tac ttc tcc atg gag ttt ggc att cac cca agc 144
 Asp Pro Leu Val Ala Tyr Phe Ser Met Glu Phe Gly Ile His Pro Ser
 35 40 45
 ctg cca atc tac tct ggc gga ctt ggt gtg ctt gcg ggc gag aac atg 192
 Leu Pro Ile Tyr Ser Gly Gly Leu Gly Val Leu Ala Gly Glu Asn Met
 50 55 60
 aag tct gca tct gac ttg ggt gtg cca ctg atc ggt gtt ggt ttg ctc 240
 Lys Ser Ala Ser Asp Leu Gly Val Pro Leu Ile Gly Val Gly Leu Leu
 65 70 75 80
 tac acc cac ggc tac ttc acc cag tca ctg tcc ggt gac ggt tgg cag 288
 Tyr Thr His Gly Tyr Phe Thr Gln Ser Leu Ser Gly Asp Gly Trp Gln
 85 90 95
 cag gaa gag tac aag tac cac gat cca gca gaa ctg ccg att gag gca 336
 Gln Glu Glu Tyr Lys Tyr His Asp Pro Ala Glu Leu Pro Ile Glu Ala
 100 105 110
 gtt aaa gat aag aac ggc gag cag gtc act gtt tct gtc acc tac cca 384
 Val Lys Asp Lys Asn Gly Glu Gln Val Thr Val Ser Val Thr Tyr Pro
 115 120 125
 ggt gcg cag gaa gta aag att gca ctg tgg gta gca aac gtt ggc cgc 432
 Gly Ala Gln Glu Val Lys Ile Ala Leu Trp Val Ala Asn Val Gly Arg
 130 135 140
 atc cca ttg ctg ctg ctt gat acc aac atc gag gca aac cca gaa gag 480
 Ile Pro Leu Leu Leu Leu Asp Thr Asn Ile Glu Ala Asn Pro Glu Glu
 145 150 155 160
 ctc cgc aac gtt act gac cgc ctg tac ggt ggc gac aat gag cac cgc 528
 Leu Arg Asn Val Thr Asp Arg Leu Tyr Gly Gly Asp Asn Glu His Arg
 165 170 175
 atc aag cag gaa ctc gtt ctc ggt gtt ggt ggc gtc cgc gct gtc aac 576
 Ile Lys Gln Glu Leu Val Leu Gly Val Gly Gly Val Arg Ala Val Asn
 180 185 190

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aac gaa ggc cac gca ggt ttc ctg acc ctg gag cgt atc cgc gag cgc	672
Asn Glu Gly His Ala Gly Phe Leu Thr Leu Glu Arg Ile Arg Glu Arg	
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atc gca gag ggc atg gag tac cca gca gca ttc gag cag gtt cgt gcg	720
Ile Ala Glu Gly Met Glu Tyr Pro Ala Ala Phe Glu Gln Val Arg Ala	
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Ser Asn Ile Phe Thr Thr His Thr Pro Val Pro Ala Gly Ile Asp Arg	
245 250 255	
ttc gac atg gag atg gtg cgt cgt tat ctc ggt ggc ggt cag cca gaa	816
Phe Asp Met Glu Met Val Arg Arg Tyr Leu Gly Gly Gly Gln Pro Glu	
260 265 270	
gat cag cag ctg tgc gtt ggt gtt cca att gag aag gca ctt gag ctt	864
Asp Gln Gln Leu Cys Val Gly Val Pro Ile Glu Lys Ala Leu Glu Leu	
275 280 285	
ggt caa gag tcc gat cca cac cgc ttc aac atg gct cat atg ggc ctt	912
Gly Gln Glu Ser Asp Pro His Arg Phe Asn Met Ala His Met Gly Leu	
290 295 300	
cgc gcg agc caa cat gct aat ggc gtc gca aag ctt cat ggt gaa gta	960
Arg Ala Ser Gln His Ala Asn Gly Val Ala Lys Leu His Gly Glu Val	
305 310 315 320	
agc cgt gac atg ttc gcc ggc ctg tac ccc gga tat gag cct cgt gaa	1008
Ser Arg Asp Met Phe Ala Gly Leu Tyr Pro Gly Tyr Glu Pro Arg Glu	
325 330 335	
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Val Pro Ile Gly His Val Thr Asn Gly Val His Leu Pro Thr Trp Val	
340 345 350	
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Lys Pro Glu Met Lys Glu Leu Ile Asp Arg Val Thr Gly Gly Ala Asp	
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Leu Ala Val Ala Asp Ser Trp Ser Asn Pro Gln Ala Val Glu Ser Glu	
370 375 380	
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Lys Ile Trp Lys Val Arg Asn Lys Phe Arg Ala Asp Leu Val Glu Val	
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gct cgc gct gca act gca aag tcc tgg tct cac cgt gga cac acc gaa	1248
Ala Arg Ala Ala Thr Ala Lys Ser Trp Ser His Arg Gly His Thr Glu	
405 410 415	
gca gaa ctt gcg tgg acc tcc cgc gtt ctg gat cca aac gtg ctg acc	1296
Ala Glu Leu Ala Trp Thr Ser Arg Val Leu Asp Pro Asn Val Leu Thr	
420 425 430	
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Ile	Gly	Phe	Ala	Arg	Arg	Val	Ser	Thr	Tyr	Lys	Arg	Leu	Thr	Leu	Met	
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Leu	Arg	Asn	Pro	Glu	Arg	Leu	Arg	Ser	Ile	Leu	Leu	Asn	Glu	Glu	Arg	
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cca	gtt	cag	ttc	gtt	att	gct	ggg	aag	gca	cac	cca	cat	gac	atg	ggg	1440
Pro	Val	Gln	Phe	Val	Ile	Ala	Gly	Lys	Ala	His	Pro	His	Asp	Met	Gly	
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ggc	aag	aag	ctc	atg	cag	gaa	atc	gtc	cac	ttc	gct	gat	caa	gct	ggg	1488
Gly	Lys	Lys	Leu	Met	Gln	Glu	Ile	Val	His	Phe	Ala	Asp	Gln	Ala	Gly	
				485					490					495		
gtc	cgt	gac	cgt	ttc	ctc	ttc	ctg	cct	gat	tac	gac	atc	aac	ctg	gcc	1536
Val	Arg	Asp	Arg	Phe	Leu	Phe	Leu	Pro	Asp	Tyr	Asp	Ile	Asn	Leu	Ala	
			500					505					510			
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Ser	Tyr	Leu	Ile	Ser	Gly	Ala	Asp	Val	Trp	Leu	Asn	Asn	Pro	Val	Arg	
		515					520					525				
cct	cag	gaa	gca	tcg	gga	acc	tcc	ggg	atg	aag	gcc	gtc	atg	aat	ggg	1632
Pro	Gln	Glu	Ala	Ser	Gly	Thr	Ser	Gly	Met	Lys	Ala	Val	Met	Asn	Gly	
		530				535					540					
ggc	ctg	acc	ctg	tcc	atc	tct	gat	ggg	tgg	tgg	gat	gaa	atg	cct	aag	1680
Gly	Leu	Thr	Leu	Ser	Ile	Ser	Asp	Gly	Trp	Trp	Asp	Glu	Met	Pro	Lys	
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gag	acc	acc	ggc	tgg	acc	atc	cca	acc	gtt	gag	tcc	cag	gac	ttg	gaa	1728
Glu	Thr	Thr	Gly	Trp	Thr	Ile	Pro	Thr	Val	Glu	Ser	Gln	Asp	Leu	Glu	
				565					570					575		
tgc	cgc	gac	cac	ctg	gaa	tcc	cag	gcg	ctg	tac	gac	ctg	ctg	gaa	aac	1776
Cys	Arg	Asp	His	Leu	Glu	Ser	Gln	Ala	Leu	Tyr	Asp	Leu	Leu	Glu	Asn	
			580					585					590			
gaa	gtt	gca	ccg	ctg	ttt	tac	aag	cgc	gac	aag	aac	ggc	atc	cca	cag	1824
Glu	Val	Ala	Pro	Leu	Phe	Tyr	Lys	Arg	Asp	Lys	Asn	Gly	Ile	Pro	Gln	
		595					600					605				
gac	tgg	ctg	gac	ctg	gtt	cgc	gaa	tcc	tgg	acc	acc	ctg	tca	cca	atg	1872
Asp	Trp	Leu	Asp	Leu	Val	Arg	Glu	Ser	Trp	Thr	Thr	Leu	Ser	Pro	Met	
		610				615					620					
gtc	acc	tcc	acc	cgc	atg	gtg	cgc	gac	tac	acc	acc	cag	tac	tac	cgc	1920
Val	Thr	Ser	Thr	Arg	Met	Val	Arg	Asp	Tyr	Thr	Thr	Gln	Tyr	Tyr	Arg	
					630				635						640	
cca	acc	aaa	cac	cag	gca	gag	ctc	att	gcg	cag	cct	gca	gaa	gca	gcg	1968
Pro	Thr	Lys	His	Gln	Ala	Glu	Leu	Ile	Ala	Gln	Pro	Ala	Glu	Ala	Ala	
				645					650					655		
gat	tac	gcg	gca	tgg	ctt	gag	cac	atc	aaa	gca	gag	tgg	gct	ggc	gtc	2016
Asp	Tyr	Ala	Ala	Trp	Leu	Glu	His	Ile	Lys	Ala	Glu	Trp	Ala	Gly	Val	
			660					665					670			
aag	gtc	tca	gac	ctg	aag	atc	agc	gag	agc	gcc	atc	acg	gcg	cag	gag	2064
Lys	Val	Ser	Asp	Leu	Lys	Ile	Ser	Glu	Ser	Ala	Ile	Thr	Ala	Gln	Glu	

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Leu Glu Val Ser Val Arg Val Asp Ser Gly Ser Leu Asn Asp Asp Glu
    690              695              700

ttc caa gct cag gca ctc ttt ggt gcg ctc gga cac aac ggt gac atc 2160
Phe Gln Ala Gln Ala Leu Phe Gly Ala Leu Gly His Asn Gly Asp Ile
    705              710              715

gaa gat cca gaa atc acc gtt ttg acc cca cgc ggc gat ggc gcc tac 2208
Glu Asp Pro Glu Ile Thr Val Leu Thr Pro Arg Gly Asp Gly Ala Tyr
    725              730              735

gcg gca aag gtc agc act gac ctg cca ggc aac tac ggc atc act gcc 2256
Ala Ala Lys Val Ser Thr Asp Leu Pro Gly Asn Tyr Gly Ile Thr Ala
    740              745              750

cgc gtt gtt cca aac aac agg atg ctg gtc agc cca gcg gaa acc cgc 2304
Arg Val Val Pro Asn Asn Arg Met Leu Val Ser Pro Ala Glu Thr Arg
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Asp Pro Leu Val Ala Tyr Phe Ser Met Glu Phe Gly Ile His Pro Ser
    35              40              45

Leu Pro Ile Tyr Ser Gly Gly Leu Gly Val Leu Ala Gly Glu Asn Met
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Lys Ser Ala Ser Asp Leu Gly Val Pro Leu Ile Gly Val Gly Leu Leu
    65              70              75              80

Tyr Thr His Gly Tyr Phe Thr Gln Ser Leu Ser Gly Asp Gly Trp Gln
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Gln Glu Glu Tyr Lys Tyr His Asp Pro Ala Glu Leu Pro Ile Glu Ala
    100              105              110

Val Lys Asp Lys Asn Gly Glu Gln Val Thr Val Ser Val Thr Tyr Pro
    115              120              125

Gly Ala Gln Glu Val Lys Ile Ala Leu Trp Val Ala Asn Val Gly Arg
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Ile Pro Leu Leu Leu Leu Asp Thr Asn Ile Glu Ala Asn Pro Glu Glu

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 180 185 190
 Ala Phe Cys Glu Ala Arg Gly Leu Lys Arg Ser Ser Val Ala His Leu
 195 200 205
 Asn Glu Gly His Ala Gly Phe Leu Thr Leu Glu Arg Ile Arg Glu Arg
 210 215 220
 Ile Ala Glu Gly Met Glu Tyr Pro Ala Ala Phe Glu Gln Val Arg Ala
 225 230 235 240
 Ser Asn Ile Phe Thr Thr His Thr Pro Val Pro Ala Gly Ile Asp Arg
 245 250 255
 Phe Asp Met Glu Met Val Arg Arg Tyr Leu Gly Gly Gly Gln Pro Glu
 260 265 270
 Asp Gln Gln Leu Cys Val Gly Val Pro Ile Glu Lys Ala Leu Glu Leu
 275 280 285
 Gly Gln Glu Ser Asp Pro His Arg Phe Asn Met Ala His Met Gly Leu
 290 295 300
 Arg Ala Ser Gln His Ala Asn Gly Val Ala Lys Leu His Gly Glu Val
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 Ser Arg Asp Met Phe Ala Gly Leu Tyr Pro Gly Tyr Glu Pro Arg Glu
 325 330 335
 Val Pro Ile Gly His Val Thr Asn Gly Val His Leu Pro Thr Trp Val
 340 345 350
 Lys Pro Glu Met Lys Glu Leu Ile Asp Arg Val Thr Gly Gly Ala Asp
 355 360 365
 Leu Ala Val Ala Asp Ser Trp Ser Asn Pro Gln Ala Val Glu Ser Glu
 370 375 380
 Lys Ile Trp Lys Val Arg Asn Lys Phe Arg Ala Asp Leu Val Glu Val
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 Ala Glu Leu Ala Trp Thr Ser Arg Val Leu Asp Pro Asn Val Leu Thr
 420 425 430
 Ile Gly Phe Ala Arg Arg Val Ser Thr Tyr Lys Arg Leu Thr Leu Met
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 Leu Arg Asn Pro Glu Arg Leu Arg Ser Ile Leu Leu Asn Glu Glu Arg
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 Pro Val Gln Phe Val Ile Ala Gly Lys Ala His Pro His Asp Met Gly
 465 470 475 480

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Gly Lys Lys Leu Met Gln Glu Ile Val His Phe Ala Asp Gln Ala Gly
 485 490 495
 Val Arg Asp Arg Phe Leu Phe Leu Pro Asp Tyr Asp Ile Asn Leu Ala
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 Ser Tyr Leu Ile Ser Gly Ala Asp Val Trp Leu Asn Asn Pro Val Arg
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 Pro Gln Glu Ala Ser Gly Thr Ser Gly Met Lys Ala Val Met Asn Gly
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 Gly Leu Thr Leu Ser Ile Ser Asp Gly Trp Trp Asp Glu Met Pro Lys
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 Glu Thr Thr Gly Trp Thr Ile Pro Thr Val Glu Ser Gln Asp Leu Glu
 565 570 575
 Cys Arg Asp His Leu Glu Ser Gln Ala Leu Tyr Asp Leu Leu Glu Asn
 580 585 590
 Glu Val Ala Pro Leu Phe Tyr Lys Arg Asp Lys Asn Gly Ile Pro Gln
 595 600 605
 Asp Trp Leu Asp Leu Val Arg Glu Ser Trp Thr Thr Leu Ser Pro Met
 610 615 620
 Val Thr Ser Thr Arg Met Val Arg Asp Tyr Thr Thr Gln Tyr Tyr Arg
 625 630 635 640
 Pro Thr Lys His Gln Ala Glu Leu Ile Ala Gln Pro Ala Glu Ala Ala
 645 650 655
 Asp Tyr Ala Ala Trp Leu Glu His Ile Lys Ala Glu Trp Ala Gly Val
 660 665 670
 Lys Val Ser Asp Leu Lys Ile Ser Glu Ser Ala Ile Thr Ala Gln Glu
 675 680 685
 Leu Glu Val Ser Val Arg Val Asp Ser Gly Ser Leu Asn Asp Asp Glu
 690 695 700
 Phe Gln Ala Gln Ala Leu Phe Gly Ala Leu Gly His Asn Gly Asp Ile
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 Glu Asp Pro Glu Ile Thr Val Leu Thr Pro Arg Gly Asp Gly Ala Tyr
 725 730 735
 Ala Ala Lys Val Ser Thr Asp Leu Pro Gly Asn Tyr Gly Ile Thr Ala
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cag gaa atc gtc cac ttc gct gat caa gct ggt gtc cgt gac cgt ttc	96
Gln Glu Ile Val His Phe Ala Asp Gln Ala Gly Val Arg Asp Arg Phe	
20 25 30	
ctc ttc ctg cct gat tac gac atc aac ctg gcc agc tac ctg atc tct	144
Leu Phe Leu Pro Asp Tyr Asp Ile Asn Leu Ala Ser Tyr Leu Ile Ser	
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ggt gct gac gtg tgg ctg aac aac cca gtg cgc cct cag gaa gca tcg	192
Gly Ala Asp Val Trp Leu Asn Asn Pro Val Arg Pro Gln Glu Ala Ser	
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gga acc tcc ggt atg aag gcc gtc atg aat ggt ggc ctg acc ctg tcc	240
Gly Thr Ser Gly Met Lys Ala Val Met Asn Gly Gly Leu Thr Leu Ser	
65 70 75 80	
atc tct gat ggt tgg tgg gat gaa atg cct aag gag acc acc ggc tgg	288
Ile Ser Asp Gly Trp Trp Asp Glu Met Pro Lys Glu Thr Thr Gly Trp	
85 90 95	
acc atc cca acc gtt gag tcc cag gac ttg gaa tgc cgc gac cac ctg	336
Thr Ile Pro Thr Val Glu Ser Gln Asp Leu Glu Cys Arg Asp His Leu	
100 105 110	
gaa tcc cag gcg ctg tac gac ctg ctg gaa aac gaa gtt gca ccg ctg	384
Glu Ser Gln Ala Leu Tyr Asp Leu Leu Glu Asn Glu Val Ala Pro Leu	
115 120 125	
ttt tac aag cgc gac aag aac ggc atc cca cag gac tgg ctg gac ctg	432
Phe Tyr Lys Arg Asp Lys Asn Gly Ile Pro Gln Asp Trp Leu Asp Leu	
130 135 140	
gtt cgc gaa tcc tgg acc acc ctg tca cca atg gtc acc tcc acc cgc	480
Val Arg Glu Ser Trp Thr Thr Leu Ser Pro Met Val Thr Ser Thr Arg	
145 150 155 160	
atg gtg cgc gac tac acc acc cag tac tac cgc cca acc aaa cac cag	528
Met Val Arg Asp Tyr Thr Thr Gln Tyr Tyr Arg Pro Thr Lys His Gln	
165 170 175	
gca gag ctc att gcg cag cct gca gaa gca gcg gat tac gcg gca tgg	576
Ala Glu Leu Ile Ala Gln Pro Ala Glu Ala Ala Asp Tyr Ala Ala Trp	
180 185 190	
ctt gag cac atc aaa gca gag tgg gct ggc gtc aag gtc tca gac ctg	624
Leu Glu His Ile Lys Ala Glu Trp Ala Gly Val Lys Val Ser Asp Leu	
195 200 205	

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Val Arg Glu Ser Trp Thr Thr Leu Ser Pro Met Val Thr Ser Thr Arg
 145 150 155 160
 Met Val Arg Asp Tyr Thr Thr Gln Tyr Tyr Arg Pro Thr Lys His Gln
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 Ala Glu Leu Ile Ala Gln Pro Ala Glu Ala Ala Asp Tyr Ala Ala Trp
 180 185 190
 Leu Glu His Ile Lys Ala Glu Trp Ala Gly Val Lys Val Ser Asp Leu
 195 200 205
 Lys Ile Ser Glu Ser Ala Ile Thr Ala Gln Glu Leu Glu Val Ser Val
 210 215 220
 Arg Val Asp Ser Gly Ser Leu Asn Asp Asp Glu Phe Gln Ala Gln Ala
 225 230 235 240
 Leu Phe Gly Ala Leu Gly His Asn Gly Asp Ile Glu Asp Pro Glu Ile
 245 250 255
 Thr Val Leu Thr Pro Arg Gly Asp Gly Ala Tyr Ala Ala Lys Val Ser
 260 265 270
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 Glu Asn
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 gac aag ctg tgg tac cag gac acc gca gat gca acc gat gct gtc gga 96
 Asp Lys Leu Trp Tyr Gln Asp Thr Ala Asp Ala Thr Asp Ala Val Gly
 20 25 30
 gat cca ctc gtt gcg tac ttc tcc atg gag ttt ggc att cac cca agc 144
 Asp Pro Leu Val Ala Tyr Phe Ser Met Glu Phe Gly Ile His Pro Ser
 35 40 45
 ctg cca atc tac tct ggc gga ctt ggt gtg ctt gcg ggc gag aac atg 192
 Leu Pro Ile Tyr Ser Gly Gly Leu Gly Val Leu Ala Gly Glu Asn Met
 50 55 60

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cgc gcg agc caa cat gct aat ggc gtc gca aag ctt cat ggt gaa gta 960
 Arg Ala Ser Gln His Ala Asn Gly Val Ala Lys Leu His Gly Glu Val
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 agc cgt gac atg ttc gcc ggc ctg tac ccc gga tat gag cct cgt gaa 1008
 Ser Arg Asp Met Phe Ala Gly Leu Tyr Pro Gly Tyr Glu Pro Arg Glu
 325 330 335
 gtg ccc atc ggg cac gtc acc aac ggt gtt cac ctg ccg acg tgg gtc 1056
 Val Pro Ile Gly His Val Thr Asn Gly Val His Leu Pro Thr Trp Val
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 aag cca gag atg aag gaa ctc atc gat cgc gtc act ggc ggc gct gat 1104
 Lys Pro Glu Met Lys Glu Leu Ile Asp Arg Val Thr Gly Gly Ala Asp
 355 360 365
 ctt gcg gtt gct gat tct tgg tca aac cca cag gct gtc gag tct gag 1152
 Leu Ala Val Ala Asp Ser Trp Ser Asn Pro Gln Ala Val Glu Ser Glu
 370 375 380
 aag atc tgg aag gtg cgc aac aag ttc cgt gct gac cta gtg gag gtt 1200
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Asp Pro Leu Val Ala Tyr Phe Ser Met Glu Phe Gly Ile His Pro Ser
 35 40 45

Leu Pro Ile Tyr Ser Gly Gly Leu Gly Val Leu Ala Gly Glu Asn Met
 50 55 60

Lys Ser Ala Ser Asp Leu Gly Val Pro Leu Ile Gly Val Gly Leu Leu
 65 70 75 80

Tyr Thr His Gly Tyr Phe Thr Gln Ser Leu Ser Gly Asp Gly Trp Gln
 85 90 95

Gln Glu Glu Tyr Lys Tyr His Asp Pro Ala Glu Leu Pro Ile Glu Ala
 100 105 110

Val Lys Asp Lys Asn Gly Glu Gln Val Thr Val Ser Val Thr Tyr Pro
 115 120 125

Gly Ala Gln Glu Val Lys Ile Ala Leu Trp Val Ala Asn Val Gly Arg
 130 135 140

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Ile Pro Leu Leu Leu Leu Asp Thr Asn Ile Glu Ala Asn Pro Glu Glu
 145 150 155 160
 Leu Arg Asn Val Thr Asp Arg Leu Tyr Gly Gly Asp Asn Glu His Arg
 165 170 175
 Ile Lys Gln Glu Leu Val Leu Gly Val Gly Gly Val Arg Ala Val Asn
 180 185 190
 Ala Phe Cys Glu Ala Arg Gly Leu Lys Arg Ser Ser Val Ala His Leu
 195 200 205
 Asn Glu Gly His Ala Gly Phe Leu Thr Leu Glu Arg Ile Arg Glu Arg
 210 215 220
 Ile Ala Glu Gly Met Glu Tyr Pro Ala Ala Phe Glu Gln Val Arg Ala
 225 230 235 240
 Ser Asn Ile Phe Thr Thr His Thr Pro Val Pro Ala Gly Ile Asp Arg
 245 250 255
 Phe Asp Met Glu Met Val Arg Arg Tyr Leu Gly Gly Gly Gln Pro Glu
 260 265 270
 Asp Gln Gln Leu Cys Val Gly Val Pro Ile Glu Lys Ala Leu Glu Leu
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 Gly Gln Glu Ser Asp Pro His Arg Phe Asn Met Ala His Met Gly Leu
 290 295 300
 Arg Ala Ser Gln His Ala Asn Gly Val Ala Lys Leu His Gly Glu Val
 305 310 315 320
 Ser Arg Asp Met Phe Ala Gly Leu Tyr Pro Gly Tyr Glu Pro Arg Glu
 325 330 335
 Val Pro Ile Gly His Val Thr Asn Gly Val His Leu Pro Thr Trp Val
 340 345 350
 Lys Pro Glu Met Lys Glu Leu Ile Asp Arg Val Thr Gly Gly Ala Asp
 355 360 365
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250	255	260		
gca ccg acc acc tca cta cca gag gat ttc gga ggc atc cgt aac tgg	931			
Ala Pro Thr Thr Ser Leu Pro Glu Asp Phe Gly Gly Ile Arg Asn Trp				
265	270	275		
gac tac cgc tac gtg tgg ctg cgc gac tcc gca ctc acc att gaa gcc	979			
Asp Tyr Arg Tyr Val Trp Leu Arg Asp Ser Ala Leu Thr Ile Glu Ala				
280	285	290		
ctc gtg gaa tac gga ttc tcc caa gca gcc ctc caa tgg cgc acc tgg	1027			
Leu Val Glu Tyr Gly Phe Ser Gln Ala Ala Leu Gln Trp Arg Thr Trp				
295	300	305		
ctg ctg cgc gcc atc gca ggc gac ccg gaa aac ctc cgc atc atg tat	1075			
Leu Leu Arg Ala Ile Ala Gly Asp Pro Glu Asn Leu Arg Ile Met Tyr				
310	315	320		
ggc ctc ggc ggc gaa cga cac ctc cct gaa cgc gaa ctc caa cac ctg	1123			
Gly Leu Gly Gly Glu Arg His Leu Pro Glu Arg Glu Leu Gln His Leu				
330	335	340		
cgc gga tac gaa aac tcc gtg cct gtt cgc gtt ggc aat gga gcc gcc	1171			
Arg Gly Tyr Glu Asn Ser Val Pro Val Arg Val Gly Asn Gly Ala Ala				
345	350	355		
gaa caa tac caa gca gat gtc gtc ggc gaa gta atg gtc gcg ctt gaa	1219			
Glu Gln Tyr Gln Ala Asp Val Val Gly Glu Val Met Val Ala Leu Glu				
360	365	370		
acc atc cgc cgc gcc ggg tgc ctc gag gac gaa ttc tcc tgg ggc atg	1267			
Thr Ile Arg Arg Ala Gly Cys Leu Glu Asp Glu Phe Ser Trp Gly Met				
375	380	385		
caa aaa gcc atc ctc gat ttc caa gaa gcc aac ttc gac cgc aag gat	1315			
Gln Lys Ala Ile Leu Asp Phe Gln Glu Ala Asn Phe Asp Arg Lys Asp				
390	395	400		
caa ggc atc tgg gaa atg cgc tcc gaa ccg caa tat ttc acc cac ggc	1363			
Gln Gly Ile Trp Glu Met Arg Ser Glu Pro Gln Tyr Phe Thr His Gly				
410	415	420		
cgc gcc atg atg tgg gcc ggc ttc gac cgc ggc atc aaa gcc atc gaa	1411			
Arg Ala Met Met Trp Ala Gly Phe Asp Arg Gly Ile Lys Ala Ile Glu				
425	430	435		
gaa ttc aac ctc gac ggc ccc atc gag cgc tgg cgt gaa ctc cgc gcc	1459			
Glu Phe Asn Leu Asp Gly Pro Ile Glu Arg Trp Arg Glu Leu Arg Ala				
440	445	450		
aaa ctc cgc gaa gaa atc atg acc aac ggc ttc aac gaa gag atc caa	1507			
Lys Leu Arg Glu Glu Ile Met Thr Asn Gly Phe Asn Glu Glu Ile Gln				
455	460	465		
tcc ttc acc cag tgc tac gac aac acc caa gtc gac gcc tcg ctg ctt	1555			
Ser Phe Thr Gln Cys Tyr Asp Asn Thr Gln Val Asp Ala Ser Leu Leu				
470	475	480		
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 Gln Leu Ala Gln Ile Gly Phe Ile Gly Phe Asp Asp Pro Lys Met Leu
 490 495 500
 agc acc gta gcg cgc att gag caa gag ctt ctc gac gcc cac ggc ttt 1651
 Ser Thr Val Ala Arg Ile Glu Gln Glu Leu Leu Asp Ala His Gly Phe
 505 510 515
 ctt cac agg tac cac acc gac ggg tct gac ggc ctt gcc ggc gac gaa 1699
 Leu His Arg Tyr His Thr Asp Gly Ser Asp Gly Leu Ala Gly Asp Glu
 520 525 530
 tac ccc ttc ctc atc tgt tca ttc tgg ctg gta gaa caa tac gca agc 1747
 Tyr Pro Phe Leu Ile Cys Ser Phe Trp Leu Val Glu Gln Tyr Ala Ser
 535 540 545
 tcc aac cgc ctc gac gag gcc aaa gaa aag atg aac cgc atc ctt gcc 1795
 Ser Asn Arg Leu Asp Glu Ala Lys Glu Lys Met Asn Arg Ile Leu Ala
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 gtc caa agc cca ctt ggc cta ctg gct gag gaa tac tcc acc cac cat 1843
 Val Gln Ser Pro Leu Gly Leu Leu Ala Glu Glu Tyr Ser Thr His His
 570 575 580
 ggc agg ctc gct gga aac tac cct cag gcc ttt tcc cac att ggt ctg 1891
 Gly Arg Leu Ala Gly Asn Tyr Pro Gln Ala Phe Ser His Ile Gly Leu
 585 590 595
 atc agc gct gcc cgt gcc ata aat ttc gaa gaa gcg cga aac agg 1936
 Ile Ser Ala Ala Arg Ala Ile Asn Phe Glu Glu Ala Arg Asn Arg
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<212> PRT

<213> Corynebacterium glutamicum

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Leu Ser Asn Met Gly Ser Leu Asp Trp Leu Cys Leu Pro Arg Phe Asp
 35 40 45

Ser Gln Ala Met Phe Thr Arg Leu Leu Gly Asp Arg Glu His Gly His
 50 55 60

Trp Ser Leu Arg Val Pro Gly Gly Glu Val Ile Ser Gln Asn Tyr Leu
 65 70 75 80

Gly Asp Ser Phe Val Val Gln Thr Val Trp Arg Ser Glu Thr Gly Thr
 85 90 95

Ala Arg Val Val Asp Phe Met Pro Ile His Gly Gln Glu Gln Pro Asp

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Ala	Gly	Pro	Asn	Ala	Val	Tyr	Val	Arg	Gly	Pro	Glu	Met	Pro	His	Arg
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Gln	Trp	Arg	Thr	Trp	Leu	Leu	Arg	Ala	Ile	Ala	Gly	Asp	Pro	Glu	Asn
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Met	Val	Ala	Leu	Glu	Thr	Ile	Arg	Arg	Ala	Gly	Cys	Leu	Glu	Asp	Glu
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Phe	Ser	Trp	Gly	Met	Gln	Lys	Ala	Ile	Leu	Asp	Phe	Gln	Glu	Ala	Asn
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Phe	Asp	Arg	Lys	Asp	Gln	Gly	Ile	Trp	Glu	Met	Arg	Ser	Glu	Pro	Gln
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Tyr	Phe	Thr	His	Gly	Arg	Ala	Met	Met	Trp	Ala	Gly	Phe	Asp	Arg	Gly
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Ile Lys Ala Ile Glu Glu Phe Asn Leu Asp Gly Pro Ile Glu Arg Trp
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 Arg Glu Leu Arg Ala Lys Leu Arg Glu Glu Ile Met Thr Asn Gly Phe
 450 455 460
 Asn Glu Glu Ile Gln Ser Phe Thr Gln Cys Tyr Asp Asn Thr Gln Val
 465 470 475 480
 Asp Ala Ser Leu Leu Gln Leu Ala Gln Ile Gly Phe Ile Gly Phe Asp
 485 490 495
 Asp Pro Lys Met Leu Ser Thr Val Ala Arg Ile Glu Gln Glu Leu Leu
 500 505 510
 Asp Ala His Gly Phe Leu His Arg Tyr His Thr Asp Gly Ser Asp Gly
 515 520 525
 Leu Ala Gly Asp Glu Tyr Pro Phe Leu Ile Cys Ser Phe Trp Leu Val
 530 535 540
 Glu Gln Tyr Ala Ser Ser Asn Arg Leu Asp Glu Ala Lys Glu Lys Met
 545 550 555 560
 Asn Arg Ile Leu Ala Val Gln Ser Pro Leu Gly Leu Leu Ala Glu Glu
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 Tyr Ser Thr His His Gly Arg Leu Ala Gly Asn Tyr Pro Gln Ala Phe
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 Met Ala Asp Val Ala
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 aaa gct gct gga gta tcc act gcg ctg gtc tcc atc gtg ttt cgc gat 163
 Lys Ala Ala Gly Val Ser Thr Ala Leu Val Ser Ile Val Phe Arg Asp
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 gcc ccc gga gca agt gaa tcc acc cgc aac cat gtg aaa gaa aaa gcc 211
 Ala Pro Gly Ala Ser Glu Ser Thr Arg Asn His Val Lys Glu Lys Ala

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Ala	Glu	Leu	Gly	Tyr	Ile	Pro	Asp	Arg	Arg	Ala	Gln	Lys	Leu	Arg	Gln					
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cac	ggc	gat	atc	gtc	gaa	cac	ctc	tat	ccc	acc	gcc	cga	aaa	cat	ggc	355				
His	Gly	Asp	Ile	Val	Glu	His	Leu	Tyr	Pro	Thr	Ala	Arg	Lys	His	Gly					
			70				75				80				85					
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Phe	Asp	Leu	Tyr	Leu	Ser	Ala	Ile	Thr	Pro	Thr	Arg	Thr	Glu	Lys	Asp					
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gcc	gtc	aac	gcc	ctg	atc	agg	gaa	cga	tgc	gaa	gca	gta	att	ctt	cta	451				
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Gly	Ser	Arg	Met	Ser	Pro	Ser	Asp	Leu	Glu	Thr	Ile	Ala	Gln	Gln	Leu					
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ccc	gtc	caa	gta	att	gcc	cgc	ggt	tcc	gga	acc	ccc	aaa	gtc	agt	tcc	547				
Pro	Val	Gln	Val	Ile	Ala	Arg	Gly	Ser	Gly	Thr	Pro	Lys	Val	Ser	Ser					
			135				140				145									
gtc	cat	gtc	gac	gac	gca	ggt	ggc	gcc	caa	tta	gcc	ctc	aac	cac	ctc	595				
Val	His	Val	Asp	Asp	Ala	Val	Gly	Ala	Gln	Leu	Ala	Leu	Asn	His	Leu					
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Ile	Glu	Leu	Gly	His	Glu	His	Ile	Ile	Tyr	Ile	Asp	Gly	Gly	Asp	Ala					
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Pro	Gly	Thr	Gln	Glu																
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Val	Lys	Glu	Lys	Ala	Ala	Glu	Leu	Gly	Tyr	Ile	Pro	Asp	Arg	Arg	Ala
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Gln	Lys	Leu	Arg	Gln	Asn	Arg	Ser	Gly	Leu	Ile	Gly	Val	Ala	Phe	Glu
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Met His Gln Ala Phe His Gly Asp Ile Val Glu His Leu Tyr Pro Thr
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Ala Arg Lys His Gly Phe Asp Leu Tyr Leu Ser Ala Ile Thr Pro Thr
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Arg Thr Glu Lys Asp Ala Val Asn Ala Leu Ile Arg Glu Arg Cys Glu
 100 105 110

Ala Val Ile Leu Leu Gly Ser Arg Met Ser Pro Ser Asp Leu Glu Thr
 115 120 125

Ile Ala Gln Gln Leu Pro Val Gln Val Ile Ala Arg Gly Ser Gly Thr
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Pro Lys Val Ser Ser Val His Val Asp Asp Ala Val Gly Ala Gln Leu
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Ala Leu Asn His Leu Ile Glu Leu Gly His Glu His Ile Ile Tyr Ile
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Asp Gly Gly Asp Ala Pro Gly Thr Gln Glu
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 Met Ala Leu Val Leu
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gga atc gat agt tcc acc caa tcc tgc aag gct ttg ctt gtc gac gcc 163
 Gly Ile Asp Ser Ser Thr Gln Ser Cys Lys Ala Leu Leu Val Asp Ala
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gcc acc ggc cag gtt atc gac gaa ggc cgc gcg agt cac ccg agc ggg 211
 Ala Thr Gly Gln Val Ile Asp Glu Gly Arg Ala Ser His Pro Ser Gly
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tcg gag gta gat cca cgt gcg tgg atc gct gcg ctg gat caa gct acc 259
 Ser Glu Val Asp Pro Arg Ala Trp Ile Ala Ala Leu Asp Gln Ala Thr
 40 45 50

gag ggg ttg tta gaa cgc gcg gac gct gta tct att gca ggc cag cag 307
 Glu Gly Leu Leu Glu Arg Ala Asp Ala Val Ser Ile Ala Gly Gln Gln
 55 60 65

cac ggc atg gtg gcg ttg gat gaa aac gat gaa atc gtt cgc ccg gcg 355
 His Gly Met Val Ala Leu Asp Glu Asn Asp Glu Ile Val Arg Pro Ala
 70 75 80 85

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 Leu Leu Trp Asn Asp Thr Arg Ser Ala Gln Ala Ala Leu Asp Leu Asn
 90 95 100

gag gag atc ggc ggc gat cag gct gcg gta gat gcc acg gga agt gtg 451
 Glu Glu Ile Gly Gly Asp Gln Ala Val Asp Ala Thr Gly Ser Val
 105 110 115

tat gtt gct tct tta act gcc acc aaa atg cgg tgg atg cgt gat cat 499
 Tyr Val Ala Ser Leu Thr Ala Thr Lys Met Arg Trp Met Arg Asp His
 120 125 130

gaa cca gaa aat gca gcg cgc acg gcg tcg gtg atg ttg cct cat gat 547
 Glu Pro Glu Asn Ala Ala Arg Thr Ala Ser Val Met Leu Pro His Asp
 135 140 145

ttc ctc acc tgg cat ttg atg gga cgc gga cgc aaa gtc acc gac cat 595
 Phe Leu Thr Trp His Leu Met Gly Arg Gly Arg Lys Val Thr Asp His
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ggt gat gct tct gga acg ggc tac tac agc acg cgt gat cgt gcg tgg 643
 Gly Asp Ala Ser Gly Thr Gly Tyr Tyr Ser Thr Arg Asp Arg Ala Trp
 170 175 180

cgc acc gat cta gct gcc ttg gcg ctg ggc cat gag gtg gaa ctt cct 691
 Arg Thr Asp Leu Ala Ala Leu Ala Leu Gly His Glu Val Glu Leu Pro
 185 190 195

gaa ctc ctg gcc cca aat gcg att gcg gga aca act cca ggt gga gtg 739
 Glu Leu Leu Ala Pro Asn Ala Ile Ala Gly Thr Thr Pro Gly Gly Val
 200 205 210

aaa gtt gct gca ggc acg gga gat aat gct gcg gct gcg ctt ggc ctt 787
 Lys Val Ala Ala Gly Thr Gly Asp Asn Ala Ala Ala Leu Gly Leu
 215 220 225

gat ttg cag cct ggt gat gtc agc gtg tcg atc ggc acc tct ggc gtt 835
 Asp Leu Gln Pro Gly Asp Val Ser Val Ser Ile Gly Thr Ser Gly Val
 230 235 240 245

gcc ggc atg acc gtt caa cat agc gtc cac gat cca tct ggt ttg gtc 883
 Ala Gly Met Thr Val Gln His Ser Val His Asp Pro Ser Gly Leu Val
 250 255 260

act ggt ttc gcc gat gcc acg ggt gcg tat ttc ccg ctg gcc tgc acg 931
 Thr Gly Phe Ala Asp Ala Thr Gly Ala Tyr Phe Pro Leu Ala Cys Thr
 265 270 275

ctt aat ggc gca ccg gtg ttg gaa ttc ggc cgc cgc att ctg ggc gtg 979
 Leu Asn Gly Ala Pro Val Leu Glu Phe Gly Arg Arg Ile Leu Gly Val
 280 285 290

gaa tgg gaa gag ttc gat gcg ctt gca ctg gct gct caa ccc ggt tca 1027
 Glu Trp Glu Glu Phe Asp Ala Leu Ala Leu Ala Ala Gln Pro Gly Ser
 295 300 305

ggt ggc gtg acg ctc cag cct tat ttg gag ggc gag cgt acg ccg aat 1075
 Gly Gly Val Thr Leu Gln Pro Tyr Leu Glu Gly Glu Arg Thr Pro Asn
 310 315 320 325

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Ala Leu Asp Leu Asn Glu Glu Ile Gly Gly Asp Gln Ala Ala Val Asp
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 Ala Thr Gly Ser Val Tyr Val Ala Ser Leu Thr Ala Thr Lys Met Arg
 115 120 125
 Trp Met Arg Asp His Glu Pro Glu Asn Ala Ala Arg Thr Ala Ser Val
 130 135 140
 Met Leu Pro His Asp Phe Leu Thr Trp His Leu Met Gly Arg Gly Arg
 145 150 155 160
 Lys Val Thr Asp His Gly Asp Ala Ser Gly Thr Gly Tyr Tyr Ser Thr
 165 170 175
 Arg Asp Arg Ala Trp Arg Thr Asp Leu Ala Ala Leu Ala Leu Gly His
 180 185 190
 Glu Val Glu Leu Pro Glu Leu Leu Ala Pro Asn Ala Ile Ala Gly Thr
 195 200 205
 Thr Pro Gly Gly Val Lys Val Ala Ala Gly Thr Gly Asp Asn Ala Ala
 210 215 220
 Ala Ala Leu Gly Leu Asp Leu Gln Pro Gly Asp Val Ser Val Ser Ile
 225 230 235 240
 Gly Thr Ser Gly Val Ala Gly Met Thr Val Gln His Ser Val His Asp
 245 250 255
 Pro Ser Gly Leu Val Thr Gly Phe Ala Asp Ala Thr Gly Ala Tyr Phe
 260 265 270
 Pro Leu Ala Cys Thr Leu Asn Gly Ala Pro Val Leu Glu Phe Gly Arg
 275 280 285
 Arg Ile Leu Gly Val Glu Trp Glu Glu Phe Asp Ala Leu Ala Leu Ala
 290 295 300
 Ala Gln Pro Gly Ser Gly Gly Val Thr Leu Gln Pro Tyr Leu Glu Gly
 305 310 315 320
 Glu Arg Thr Pro Asn Arg Pro Ala Ala Arg Gly Val Leu Ala Gly Leu
 325 330 335
 Asn Cys Ala Thr Thr Arg Glu Asp Phe Ala Arg Ala Thr Val Glu Gly
 340 345 350
 Leu Leu Leu Ala Leu Asp Asp Ala Val Thr Ala Leu Val Glu Ala Thr
 355 360 365
 Gly Val Pro Val Gln Arg Ile Gln Leu Ile Gly Gly Gly Ala Arg Ser
 370 375 380
 Gln Ala Val Arg Glu Ile Ala Pro Glu Ile Phe Gly His Glu Ile Val
 385 390 395 400
 Val Pro Glu Pro Ala Glu Tyr Val Ala Leu Gly Ala Ala Arg Gln Ala
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 Ala Trp Ala Leu Ser Gly Glu Ala Thr Pro Pro Gln Trp Pro Thr Pro

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Ser	Leu	Thr	Ala	Thr	Lys	Met	Arg	Trp	Met	Arg	Asp	His	Glu	Pro	Glu	
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aat	gca	gcg	cgc	acg	gcg	tcg	gtg	atg	ttg	cct	cat	gat	ttc	ctc	acc	192
Asn	Ala	Ala	Arg	Thr	Ala	Ser	Val	Met	Leu	Pro	His	Asp	Phe	Leu	Thr	
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Trp	His	Leu	Met	Gly	Arg	Gly	Arg	Lys	Val	Thr	Asp	His	Gly	Asp	Ala	
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Ser	Gly	Thr	Gly	Tyr	Tyr	Ser	Thr	Arg	Asp	Arg	Ala	Trp	Arg	Thr	Asp	
85				90				95								
cta	gct	gcc	ttg	gcg	ctg	ggc	cat	gag	gtg	gaa	ctt	cct	gaa	ctc	ctg	336
Leu	Ala	Ala	Leu	Ala	Leu	Gly	His	Glu	Val	Glu	Leu	Pro	Glu	Leu	Leu	
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gcc	cca	aat	gcg	att	gcg	gga	aca	act	cca	ggt	gga	gtg	aaa	gtt	gct	384
Ala	Pro	Asn	Ala	Ile	Ala	Gly	Thr	Thr	Pro	Gly	Gly	Val	Lys	Val	Ala	
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gca	ggc	acg	gga	gat	aat	gct	gcg	gct	gcg	ctt	ggc	ctt	gat	ttg	cag	432
Ala	Gly	Thr	Gly	Asp	Asn	Ala	Ala	Ala	Ala	Leu	Gly	Leu	Asp	Leu	Gln	
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cct	ggt	gat	gtc	agc	gtg	tcg	atc	ggc	acc	tct	ggc	gtt	gcc	ggc	atg	480
Pro	Gly	Asp	Val	Ser	Val	Ser	Ile	Gly	Thr	Ser	Gly	Val	Ala	Gly	Met	
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 35 40 45
 Asn Ala Ala Arg Thr Ala Ser Val Met Leu Pro His Asp Phe Leu Thr
 50 55 60
 Trp His Leu Met Gly Arg Gly Arg Lys Val Thr Asp His Gly Asp Ala
 65 70 75 80
 Ser Gly Thr Gly Tyr Tyr Ser Thr Arg Asp Arg Ala Trp Arg Thr Asp
 85 90 95
 Leu Ala Ala Leu Ala Leu Gly His Glu Val Glu Leu Pro Glu Leu Leu
 100 105 110
 Ala Pro Asn Ala Ile Ala Gly Thr Thr Pro Gly Gly Val Lys Val Ala
 115 120 125
 Ala Gly Thr Gly Asp Asn Ala Ala Ala Ala Leu Gly Leu Asp Leu Gln
 130 135 140
 Pro Gly Asp Val Ser Val Ser Ile Gly Thr Ser Gly Val Ala Gly Met
 145 150 155 160
 Thr Val Gln His Ser Val His Asp Pro Ser Gly Leu Val Thr Gly Phe
 165 170 175
 Ala Asp Ala Thr Gly Ala Tyr Phe Pro Leu Ala Cys Thr Leu Asn Gly
 180 185 190
 Ala Pro Val Leu Glu Phe Gly Arg Arg Ile Leu Gly Val Glu Trp Glu
 195 200 205
 Glu Phe Asp Ala Leu Ala Leu Ala Ala Gln Pro Gly Ser Gly Gly Val
 210 215 220
 Thr Leu Gln Pro Tyr Leu Glu Gly Glu Arg Thr Pro Asn Arg Pro Ala
 225 230 235 240
 Ala Arg Gly Val Leu Ala Gly Leu Asn Cys Ala Thr Thr Arg Glu Asp
 245 250 255
 Phe Ala Arg Ala Thr Val Glu Gly Leu Leu Leu Ala Leu Asp Asp Ala
 260 265 270
 Val Thr Ala Leu Val Glu Ala Thr Gly Val Pro Val Gln Arg Ile Gln
 275 280 285
 Leu Ile Gly Gly Gly Ala Arg Ser Gln Ala Val Arg Glu Ile Ala Pro
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Met 1 Asp 1 Ser 1 Pro 1 Met 5																
agt aac tca acc ggt acc gac att gtc gtt gtc gga tcc atc aat gcc																163
Ser Asn Ser Thr Gly Thr Asp Ile Val Val Val Gly Ser Ile Asn Ala																
gat ctc acc gca aaa gtt caa cgc cac cct gaa cct gga gaa acc ctc																211
Asp Leu Thr Ala Lys Val Gln Arg His Pro Glu Pro Gly Glu Thr Leu																
ctg ggt agc ggc ggc aca gtg agt gct ggt ggc aaa ggc gcc aac caa																259
Leu Gly Ser Gly Gly Thr Val Ser Ala Gly Gly Lys Gly Ala Asn Gln																
gct gtg gcg gca gcg caa tta ggt gcc aaa gtc acc atg atc ggt gcg																307
Ala Val Ala Ala Ala Gln Leu Gly Ala Lys Val Thr Met Ile Gly Ala																
gtc gga acc gat caa atg gct ggc gag gcg ctg aca cat ttg cgt caa																355
Val Gly Thr Asp Gln Met Ala Gly Glu Ala Leu Thr His Leu Arg Gln																
tca gga gca gat atg tcc gcg att gcc act gtg gac ggt ccc act ggt																403
Ser Gly Ala Asp Met Ser Ala Ile Ala Thr Val Asp Gly Pro Thr Gly																
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Leu Ala Ile Ile Thr Val Ser Asp Asp Gly Glu Asn Thr Ile Ile Val																
atc cct ggc gct aac gct tct gtc acc gcg gaa ttt gtt gat aaa cac																499
Ile Pro Gly Ala Asn Ala Ser Val Thr Ala Glu Phe Val Asp Lys His																

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 cct gcc gat ggt ttc gag cgt gcc gtt gat ctt tca caa gga cgt gtg 595
 Pro Ala Asp Gly Phe Glu Arg Ala Val Asp Leu Ser Gln Gly Arg Val
 150 155 160 165
 gtg atc aat ctg gct cca gtt gtg ccc gtg gga cat gat cag ctg cgt 643
 Val Ile Asn Leu Ala Pro Val Val Pro Val Gly His Asp Gln Leu Arg
 170 175 180
 cgt gcc gat cca ttg ctg gtc aac gaa cac gaa ggc gct ctg gtg ctg 691
 Arg Ala Asp Pro Leu Leu Val Asn Glu His Glu Gly Ala Leu Val Leu
 185 190 195
 gac atg ctt gga act cca gcg acc acg tct gat ccc caa agt ttg gtc 739
 Asp Met Leu Gly Thr Pro Ala Thr Thr Ser Asp Pro Gln Ser Leu Val
 200 205 210
 act gaa ttg ctg gag cag ggt ttt act tcc gtg gtg atg aca ctt ggt 787
 Thr Glu Leu Leu Glu Gln Gly Phe Thr Ser Val Val Met Thr Leu Gly
 215 220 225
 gcc gaa ggt gct ctg gtt ggc acg ccg ggc caa ctc acg gca att cct 835
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 230 235 240 245
 acc cca aag 844
 Thr Pro Lys

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 <212> PRT
 <213> Corynebacterium glutamicum

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 35 40 45
 Lys Gly Ala Asn Gln Ala Val Ala Ala Ala Gln Leu Gly Ala Lys Val
 50 55 60
 Thr Met Ile Gly Ala Val Gly Thr Asp Gln Met Ala Gly Glu Ala Leu
 65 70 75 80
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 Asp Gly Pro Thr Gly Leu Ala Ile Ile Thr Val Ser Asp Asp Gly Glu
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<212> PRT

<213> Corynebacterium glutamicum

<400> 392

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Gly Gly His Ile Thr Ala Gly Gly Lys Gly Ala Asn Gln Ala Val Ala
 35           40           45

Ala Ala Leu Gln Gly Ala Asp Val Ala Phe Val Gly Ala Val Gly Lys
 50           55           60

Asp Pro Tyr Ala Ala Pro Ala Leu Glu Phe Leu Arg Ser Ser Gly Val
 65           70           75           80

Asp Leu Thr Ala Val Ser Glu Val Asp Asp Thr Thr Gly Leu Ala Val
          85           90           95

Ile Thr Val Ala Lys Asp Gly Glu Asn Asn Ile Val Val Ile Pro Gly
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Ala Asn Ser Leu Val Asn Cys Asp Tyr Val Ser Ser Gln Ser Ala Leu
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Leu Ala Glu Ala Gly Ile Leu Leu Leu Gln Gly Glu Ile Pro Ala Asp
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Gly Phe Lys Glu Ala Ile His His Thr Met Gly Arg Val Val Val Asn
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Leu Ala Pro Val Ile Glu Val Glu Lys Ser Ala Leu Leu Glu Ala Asp
          165           170           175

Pro Ile Ile Ala Asn Glu His Glu Ala Gly Leu Ile Leu Asp Gln Phe
          180           185           190

Gly Ala Gly Ile Asp Ser Met Asp Pro His Glu Leu Ala Gln Ala Leu
 195           200           205

Leu Asp Ala Gly Phe Ala Ser Val Val Leu Thr Leu Gly Ser Ala Gly
 210           215           220

Ala Leu Val Ala Asp Ala Thr Gly Ile Thr Asp Ile Ala Thr Pro Thr
 225           230           235           240

Val Gln Ala Val Asp Thr Thr Gly Ala Gly Asp Ala Phe Ala Gly Ala
          245           250           255

Phe Cys Ala Arg Leu Ile Lys Gly Asp Ser Leu Ile Asp Ala Ala Thr
          260           265           270

His Ala Ala Arg Val Gly Ala Tyr Ser Val Gln Thr Ala Gly Ala Gln
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Ala Ser Tyr Pro Asp Ala Ser Val Ser Leu Pro Ser Val

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Ala His Asn Pro Glu Asn Tyr Ser Thr Gly Gly Gly Asn Ile Ile Gly																20
10 15																
gga gtg gtc agc ccc act ctc gcg gct tcc gaa tgg ggt tgg caa gtt																211
Gly Val Val Ser Pro Thr Leu Ala Ala Ser Glu Trp Gly Trp Gln Val																35
25 30																
gat ccc ctc ggt ttg cgc atc gtc ctg aac aac tac tgg gag cgc tgg																259
Asp Pro Leu Gly Leu Arg Ile Val Leu Asn Asn Tyr Trp Glu Arg Trp																50
40 45																
cag aag cca ctg ttc atc gtc gaa aac gga cta gga gca aag gac gtg																307
Gln Lys Pro Leu Phe Ile Val Glu Asn Gly Leu Gly Ala Lys Asp Val																65
55 60 65																
ctt atc gac gga ccc tcc ggc cca aca gta aac gat gac tac cgc atc																355
Leu Ile Asp Gly Pro Ser Gly Pro Thr Val Asn Asp Asp Tyr Arg Ile																85
70 75 80																
aaa tac ctc gac gac ggc ggc tca gga atc ttg aag cgc tac aag aag																403
Lys Tyr Leu Asp Asp Gly Gly Ser Gly Ile Leu Lys Arg Tyr Lys Lys																100
90 95 100																
aag tcc ttt gat tgg tgc cgc gac atc atc gcc acc aat ggc gaa agc																451
Lys Ser Phe Asp Trp Cys Arg Asp Ile Ile Ala Thr Asn Gly Glu Ser																115
105 110 115																
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Leu Glu Ser																120

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Trp Gly Trp Gln Val Asp Pro Leu Gly Leu Arg Ile Val Leu Asn Asn
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 Tyr Trp Glu Arg Trp Gln Lys Pro Leu Phe Ile Val Glu Asn Gly Leu
 50 55 60
 Gly Ala Lys Asp Val Leu Ile Asp Gly Pro Ser Gly Pro Thr Val Asn
 65 70 75 80
 Asp Asp Tyr Arg Ile Lys Tyr Leu Asp Asp Gly Gly Ser Gly Ile Leu
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 Lys Arg Tyr Lys Lys Lys Ser Phe Asp Trp Cys Arg Asp Ile Ile Ala
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 Thr Asn Gly Glu Ser Leu Glu Ser
 115 120

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 Met Asp Met Thr Ile
 1 5
 tcc cgc tcc acc atg gcc caa atc ctt gac tac acc ctc ctc gga cca 163
 Ser Arg Ser Thr Met Ala Gln Ile Leu Asp Tyr Thr Leu Leu Gly Pro
 10 15 20
 gaa gta acc aac tcc gaa ctg gcc gca ttt ata gat tcc gca att gag 211
 Glu Val Thr Asn Ser Glu Leu Ala Ala Phe Ile Asp Ser Ala Ile Glu
 25 30 35
 ctg gga gtc ggc acg atc tgt gtc ccc aac agc atg gtc aac cta act 259
 Leu Gly Val Gly Thr Ile Cys Val Pro Asn Ser Met Val Asn Leu Thr
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 gca aaa gcc caa gaa gct gga att cga gtg gcc acc gtc gca gga ttc 307
 Ala Lys Ala Gln Glu Ala Gly Ile Arg Val Ala Thr Val Ala Gly Phe
 55 60 65
 ccg cac ggc aaa acc ccc gcg ttg gtg aaa gcc gcc gaa gcg cgc ctt 355
 Pro His Gly Lys Thr Pro Ala Leu Val Lys Ala Ala Glu Ala Arg Leu
 70 75 80 85
 gcc gta cag tcc gga gct tcc gaa gta gat gtt gtt ttg gat att gcg 403
 Ala Val Gln Ser Gly Ala Ser Glu Val Asp Val Val Leu Asp Ile Ala
 90 95 100
 gta gtg aaa gag gga gat gcc aat agg ttg ctg cag gaa att gtg gca 451

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Gln Glu Ile Val Ala Ile Arg Glu Ala Val Pro Ser Pro Val Val Leu
 115 120 125

Lys Phe Ile Leu Glu Thr Ala Val Val Ser Asp Glu Ala Ile Val Thr
 130 135 140

Ala Val Asn Ala Leu Ile Ala Ala Gly Ala Asp Phe Ala Lys Thr Ser
 145 150 155 160

Thr Gly Phe His Pro Ala Gly Gly Ala Thr Val Glu Ala Val Arg Val
 165 170 175

Met Ala Ser Ala Ser Arg Gly Arg Val Gly Ile Lys Ala Ala Gly Gly
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Val Lys Thr Trp Glu Asp Ala Val Ala Phe Val Glu Ala Gly Ala Thr
 195 200 205

Arg Ile Gly Thr Ser Asn Ala Gly Ala Ile Leu Glu Gly Ala Pro Glu
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 Val Thr Lys Lys Ile
 1 5

ctt att ttg gga agc act ggt tcg att gga act cag gcg ctg gac gtt 163
 Leu Ile Leu Gly Ser Thr Gly Ser Ile Gly Thr Gln Ala Leu Asp Val
 10 15 20

att gct gat aat tca gac aag ttt gag gtg gtg ggt atc gct gcg ggc 211
 Ile Ala Asp Asn Ser Asp Lys Phe Glu Val Val Gly Ile Ala Ala Gly
 25 30 35

ggt tct cag cca gac ctc gtt att tcg cag gcg cag cag ttg ggg ctg 259
 Gly Ser Gln Pro Asp Leu Val Ile Ser Gln Ala Gln Gln Leu Gly Leu
 40 45 50

gct gca gac aag gtt gcg gtt gct gat gca cag gct gcc gca gta att 307
 Ala Ala Asp Lys Val Ala Val Ala Asp Ala Gln Ala Ala Ala Val Ile
 55 60 65

tcg aag gct ctc ggc ggc gag atc atc tct gga acc gat gct gcg aag 355
 Ser Lys Ala Leu Gly Gly Glu Ile Ile Ser Gly Thr Asp Ala Ala Lys
 70 75 80 85

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Asp	Arg	Lys	Val	Val	Val	Val	Val	Asn	Asp	Asn	Gly	Arg	Ser	Tyr	Ser	
			170						175					180		
cca	acc	att	ggc	gga	ttt	gcg	gaa	aac	ctt	gcg	ggc	ctt	cgc	atg	cag	691
Pro	Thr	Ile	Gly	Gly	Phe	Ala	Glu	Asn	Leu	Ala	Gly	Leu	Arg	Met	Gln	
			185					190					195			
cct	ttc	tat	gat	cgc	ttc	atg	gaa	aag	ggc	aag	acg	tcc	ctg	aaa	tcc	739
Pro	Phe	Tyr	Asp	Arg	Phe	Met	Glu	Lys	Gly	Lys	Thr	Ser	Leu	Lys	Ser	
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Met	Gly	Trp	Val	Gly	Glu	Arg	Thr	Phe	Glu	Ala	Leu	His	Ala	Phe	Lys	
	215					220					225					
gaa	ggt	gtg	aag	agc	acc	gtc	att	ccc	acc	gaa	atg	ttc	cct	gaa	ctg	835
Glu	Gly	Val	Lys	Ser	Thr	Val	Ile	Pro	Thr	Glu	Met	Phe	Pro	Glu	Leu	
230					235					240					245	
ggc	atg	aaa	tac	gtg	ggt	ccg	gtt	gat	gga	cat	aac	caa	aaa	gct	gtc	883
Gly	Met	Lys	Tyr	Val	Gly	Pro	Val	Asp	Gly	His	Asn	Gln	Lys	Ala	Val	
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gac	aat	gcg	ctg	aaa	tac	gct	cat	gat	tat	gat	ggc	ccc	atc	atc	gtg	931
Asp	Asn	Ala	Leu	Lys	Tyr	Ala	His	Asp	Tyr	Asp	Gly	Pro	Ile	Ile	Val	
			265					270					275			
cac	atg	gtc	acc	gaa	aag	ggt	cgt	ggt	tac	gcg	cct	gct	gag	cag	gat	979
His	Met	Val	Thr	Glu	Lys	Gly	Arg	Gly	Tyr	Ala	Pro	Ala	Glu	Gln	Asp	
		280					285					290				
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Leu	Asp	Glu	Leu	Met	His	Ser	Thr	Gly	Val	Ile	Asp	Pro	Leu	Thr	Gly	
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gct	cct	aaa	tct	gca	tca	aag	ccc	ggt	tgg	acc	tct	gtg	ttc	agc	gat	1075
Ala	Pro	Lys	Ser	Ala	Ser	Lys	Pro	Gly	Trp	Thr	Ser	Val	Phe	Ser	Asp	
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Glu	Leu	Val	Lys	Ile	Gly	Ala	Gln	Asn	Glu	Asn	Val	Val	Ala	Ile	Thr	
			330					335						340		
gcc	gcg	atg	gca	ggt	cct	acc	ggt	ctg	tcc	aag	ttc	gaa	gcc	aat	ttc	1171
Ala	Ala	Met	Ala	Gly	Pro	Thr	Gly	Leu	Ser	Lys	Phe	Glu	Ala	Asn	Phe	
			345					350					355			
ccc	aac	cga	ttc	ttt	gat	gtc	ggc	att	gct	gag	cag	cac	gcg	gta	act	1219
Pro	Asn	Arg	Phe	Phe	Asp	Val	Gly	Ile	Ala	Glu	Gln	His	Ala	Val	Thr	
		360					365					370				
tct	gcc	gca	ggc	ctc	gca	ttg	ggt	gga	aaa	cac	cct	gtg	gtg	gct	att	1267
Ser	Ala	Ala	Gly	Leu	Ala	Leu	Gly	Gly	Lys	His	Pro	Val	Val	Ala	Ile	
	375					380					385					
tac	tcc	acg	ttc	ttg	aac	cgc	gct	ttt	gat	cag	ctg	ctc	atg	gat	gtg	1315
Tyr	Ser	Thr	Phe	Leu	Asn	Arg	Ala	Phe	Asp	Gln	Leu	Leu	Met	Asp	Val	
390					395					400					405	

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 Gly Met Leu Asn Gln Pro Val Thr Leu Val Leu Asp Arg Ser Gly Val
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acg ggt tcg gat gga gcg agc cac aat ggc gtc tgg gat atg gcg ctg 1411
 Thr Gly Ser Asp Gly Ala Ser His Asn Gly Val Trp Asp Met Ala Leu
 425 430 435

acc tcg atc gtt cca ggc gtg cag gtg gcg gca cca cgt gat gag gat 1459
 Thr Ser Ile Val Pro Gly Val Gln Val Ala Ala Pro Arg Asp Glu Asp
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tcc ttg cgt gag ctg ctc aat gag gct att tcc atc gat gat ggc ccc 1507
 Ser Leu Arg Glu Leu Leu Asn Glu Ala Ile Ser Ile Asp Asp Gly Pro
 455 460 465

aca gtt gtg cgt ttc ccc aag ggc gac ttg cca act cca att gtt gct 1555
 Thr Val Val Arg Phe Pro Lys Gly Asp Leu Pro Thr Pro Ile Val Ala
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atc gac acc ttg gaa gac ggc gtg gat gtc ctc gca tat gaa gac gcc 1603
 Ile Asp Thr Leu Glu Asp Gly Val Asp Val Leu Ala Tyr Glu Asp Ala
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act gac gtt gaa tca acc gac gat gcg cca tca gtt ctc atc att gcg 1651
 Thr Asp Val Glu Ser Thr Asp Asp Ala Pro Ser Val Leu Ile Ile Ala
 505 510 515

gta ggc gag cgc gca act gtt gca ctt gac gtt gct tcc agg att aaa 1699
 Val Gly Glu Arg Ala Thr Val Ala Leu Asp Val Ala Ser Arg Ile Lys
 520 525 530

cag cac ggc gtg aac gtc acg gtt gtt gac ccc cgc tgg att gtc ccc 1747
 Gln His Gly Val Asn Val Thr Val Val Asp Pro Arg Trp Ile Val Pro
 535 540 545

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 Ile Pro Gln Ser Leu Val Ala Leu Ser Asp Asp His Asp Leu Val Ile
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 630 635

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 Asp Pro Leu Thr Gly Ala Pro Lys Ser Ala Ser Lys Pro Gly Trp Thr
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 Ser Val Phe Ser Asp Glu Leu Val Lys Ile Gly Ala Gln Asn Glu Asn
 325 330 335
 Val Val Ala Ile Thr Ala Ala Met Ala Gly Pro Thr Gly Leu Ser Lys
 340 345 350
 Phe Glu Ala Asn Phe Pro Asn Arg Phe Phe Asp Val Gly Ile Ala Glu
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 Gln His Ala Val Thr Ser Ala Ala Gly Leu Ala Leu Gly Gly Lys His
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 Pro Val Val Ala Ile Tyr Ser Thr Phe Leu Asn Arg Ala Phe Asp Gln
 385 390 395 400
 Leu Leu Met Asp Val Gly Met Leu Asn Gln Pro Val Thr Leu Val Leu
 405 410 415
 Asp Arg Ser Gly Val Thr Gly Ser Asp Gly Ala Ser His Asn Gly Val
 420 425 430
 Trp Asp Met Ala Leu Thr Ser Ile Val Pro Gly Val Gln Val Ala Ala
 435 440 445
 Pro Arg Asp Glu Asp Ser Leu Arg Glu Leu Leu Asn Glu Ala Ile Ser
 450 455 460
 Ile Asp Asp Gly Pro Thr Val Val Arg Phe Pro Lys Gly Asp Leu Pro
 465 470 475 480
 Thr Pro Ile Val Ala Ile Asp Thr Leu Glu Asp Gly Val Asp Val Leu
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 Ala Tyr Glu Asp Ala Thr Asp Val Glu Ser Thr Asp Asp Ala Pro Ser
 500 505 510
 Val Leu Ile Ile Ala Val Gly Glu Arg Ala Thr Val Ala Leu Asp Val
 515 520 525
 Ala Ser Arg Ile Lys Gln His Gly Val Asn Val Thr Val Val Asp Pro
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 Arg Trp Ile Val Pro Ile Pro Gln Ser Leu Val Ala Leu Ser Asp Asp
 545 550 555 560
 His Asp Leu Val Ile Thr Ile Glu Asp Gly Val Ile His Gly Gly Val
 565 570 575
 Gly Ser Leu Leu Ser Asp Ala Leu Asn Ala Ser Glu Val Asp Thr Pro
 580 585 590
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Leu	Thr	Gly	Ala	Pro	Lys	Ser	Ala	Ser	Lys	Pro	Gly	Trp	Thr	Ser	Val	
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Phe	Ser	Asp	Glu	Leu	Val	Lys	Ile	Gly	Ala	Gln	Asn	Glu	Asn	Val	Val	
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Ala	Asn	Phe	Pro	Asn	Arg	Phe	Phe	Asp	Val	Gly	Ile	Ala	Glu	Gln	His	
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Ala	Val	Thr	Ser	Ala	Ala	Gly	Leu	Ala	Leu	Gly	Gly	Lys	His	Pro	Val	
85			90			95										
gtg	gct	att	tac	tcc	acg	ttc	ttg	aac	cgc	gct	ttt	gat	cag	ctg	ctc	336
Val	Ala	Ile	Tyr	Ser	Thr	Phe	Leu	Asn	Arg	Ala	Phe	Asp	Gln	Leu	Leu	
100			105			110										
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Met	Asp	Val	Gly	Met	Leu	Asn	Gln	Pro	Val	Thr	Leu	Val	Leu	Asp	Arg	
115			120			125										
tca	ggg	gtc	acg	ggg	tcg	gat	gga	gcg	agc	cac	aat	ggc	gtc	tgg	gat	432
Ser	Gly	Val	Thr	Gly	Ser	Asp	Gly	Ala	Ser	His	Asn	Gly	Val	Trp	Asp	
130			135			140										
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Met	Ala	Leu	Thr	Ser	Ile	Val	Pro	Gly	Val	Gln	Val	Ala	Ala	Pro	Arg	
145			150			155										
gat	gag	gat	tcc	ttg	cgt	gag	ctg	ctc	aat	gag	gct	att	tcc	atc	gat	528
Asp	Glu	Asp	Ser	Leu	Arg	Glu	Leu	Leu	Asn	Glu	Ala	Ile	Ser	Ile	Asp	
165			170			175										

[illegible]

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 Ile Val Ala Ile Asp Thr Leu Glu Asp Gly Val Asp Val Leu Ala Tyr
 195 200 205

gaa gac gcc act gac gtt gaa tca acc gac gat gcg cca tca gtt ctc 672
 Glu Asp Ala Thr Asp Val Glu Ser Thr Asp Asp Ala Pro Ser Val Leu
 210 215 220

atc att gcg gta ggc gag cgc gca act gtt gca ctt gac gtt gct tcc 720
 Ile Ile Ala Val Gly Glu Arg Ala Thr Val Ala Leu Asp Val Ala Ser
 225 230 235 240

agg att aaa cag cac ggc gtg aac gtc acg gtt gtt gac ccc cgc tgg 768
 Arg Ile Lys Gln His Gly Val Asn Val Thr Val Val Asp Pro Arg Trp
 245 250 255

att gtc ccc atc ccg cag tcc ttg gtc gcg ctg tct gat gat cat gac 816
 Ile Val Pro Ile Pro Gln Ser Leu Val Ala Leu Ser Asp Asp His Asp
 260 265 270

ctc gtg atc acc atc gaa gac ggc gtc atc cac ggc ggc gtg gga tcc 864
 Leu Val Ile Thr Ile Glu Asp Gly Val Ile His Gly Gly Val Gly Ser
 275 280 285

ttg ctc tct gat gcg ctt aac gcc tct gag gtg gat acc cct cgc cga 912
 Leu Leu Ser Asp Ala Leu Asn Ala Ser Glu Val Asp Thr Pro Arg Arg
 290 295 300

caa atc gcc gtg ccc cag aag tac ctg gat cac gcg tcc cgc aat gaa 960
 Gln Ile Ala Val Pro Gln Lys Tyr Leu Asp His Ala Ser Arg Asn Glu
 305 310 315 320

gtg ctc gcc gat tat ggc ctc gac gcc gac ggc att gaa acc act gtt 1008
 Val Leu Ala Asp Tyr Gly Leu Asp Ala Asp Gly Ile Glu Thr Thr Val
 325 330 335

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ccg 1061

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<213> Corynebacterium glutamicum

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Phe Ser Asp Glu Leu Val Lys Ile Gly Ala Gln Asn Glu Asn Val Val
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Asp	His	Asn	Ala	Leu	Val	Gly	Ile	Leu	Ala	Leu	Glu	Ala	Glu	Leu	Ala		
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ggc	gcc	gtt	gtc	att	ggg	gaa	gat	ctg	gga	acg	ttt	gag	cct	tgg	gta	1651	
Gly	Ala	Val	Val	Ile	Gly	Glu	Asp	Leu	Gly	Thr	Phe	Glu	Pro	Trp	Val		
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Gln	Asp	Ala	Leu	Ala	Gln	Arg	Gly	Ile	Met	Gly	Thr	Ser	Ile	Leu	Trp		
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Phe	Glu	His	Ser	Pro	Ser	Gln	Pro	Gly	Pro	Arg	Arg	Gln	Glu	Glu	Tyr		
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cgt	ccg	ctg	gcc	ttg	acc	act	gtg	acc	act	cat	gat	ctc	cct	ccg	act	1795	
Arg	Pro	Leu	Ala	Leu	Thr	Val	Thr	Thr	Thr	His	Asp	Leu	Pro	Pro	Thr		
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Val	Leu	Asn	Thr	Asp	Pro	Ala	Ala	Glu	Leu	Ala	Glu	Asp	Leu	Gln	Trp		
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Gln	Ala	Glu	Ile	Leu	Asp	Val	Ala	Ala	Ser	Ala	Asn	Ala	Leu	Pro	Ala		
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cgg	gaa	tac	gtg	gga	ctc	gaa	cgc	gat	cag	cgc	ggg	gag	ttg	gct	gag	1987	
Arg	Glu	Tyr	Val	Gly	Leu	Glu	Arg	Asp	Gln	Arg	Gly	Glu	Leu	Ala	Glu		
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Leu	Leu	Glu	Gly	Leu	His	Thr	Phe	Val	Ala	Lys	Thr	Pro	Ser	Ala	Leu		
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acc	tgt	gtc	tgc	ttg	gta	gac	atg	gtc	ggg	gaa	aag	cgg	gca	cag	aat	2083	
Thr	Cys	Val	Cys	Leu	Val	Asp	Met	Val	Gly	Glu	Lys	Arg	Ala	Gln	Asn		
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cag	ccg	ggc	aca	acg	agg	gat	atg	tat	ccc	aac	tgg	tgt	atc	cca	ctg	2131	
Gln	Pro	Gly	Thr	Thr	Arg	Asp	Met	Tyr	Pro	Asn	Trp	Cys	Ile	Pro	Leu		
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Cys	Asp	Ser	Glu	Gly	Asn	Ser	Val	Leu	Ile	Glu	Ser	Leu	Arg	Glu	Asn		
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gag	ctg	tat	cac	cgt	gtg	gca	aag	gca	agc	aag	cga	gat	taggtccgct			2228	
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695

700

705

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2241

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<211> 706

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<213> Corynebacterium glutamicum

<400> 410

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Asp	Thr	Leu	Val	Lys	Ile	Leu	Arg	Ala	Leu	Gly	Val	Asn	Leu	Asp	Thr
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Ser	Asn	Leu	Pro	Asn	Asp	Asp	Ala	Ile	Gln	Arg	Gln	Ile	Ala	Leu	Phe
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His	Asp	Arg	Glu	Phe	Thr	Arg	Pro	Leu	Pro	Pro	Ser	Val	Val	Ala	Val
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Glu	Gly	Asp	Glu	Leu	Val	Phe	Pro	Val	His	Val	His	Asp	Gly	Ser	Pro
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Gln	Val	Glu	Asn	Trp	Thr	Ala	Pro	Arg	Glu	Ile	Asp	Gly	Ile	Arg	Trp
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Gly	Glu	Ala	Ser	Phe	Lys	Ile	Pro	Gly	Asp	Leu	Pro	Leu	Gly	Trp	His
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Lys	Leu	His	Leu	Lys	Ser	Asn	Glu	Arg	Ser	Ala	Glu	Cys	Gly	Leu	Ile
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Ile	Thr	Pro	Ala	Arg	Leu	Ser	Thr	Ala	Asp	Lys	Tyr	Leu	Asp	Ser	Pro
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Arg	Ser	Gly	Val	Met	Ala	Gln	Ile	Tyr	Ser	Val	Arg	Ser	Thr	Leu	Ser
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Trp	Gly	Met	Gly	Asp	Phe	Asn	Asp	Leu	Gly	Asn	Leu	Ala	Ser	Val	Val
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Ala	Gln	Asp	Gly	Ala	Asp	Phe	Leu	Leu	Ile	Asn	Pro	Met	His	Ala	Ala
	210					215					220				

Glu	Pro	Leu	Pro	Pro	Thr	Glu	Asp	Ser	Pro	Tyr	Leu	Pro	Thr	Thr	Arg
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Arg	Phe	Ile	Asn	Pro	Ile	Tyr	Ile	Arg	Val	Glu	Asp	Ile	Pro	Glu	Phe
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 Ala Ala Glu Leu Ala Glu Asp Leu Gln Trp Gln Ala Glu Ile Leu Asp
 585 590 595
 gtc gca gca tct gcc aac gca ttg cca gcc cgg gaa tac gtg gga ctc 1939
 Val Ala Ala Ser Ala Asn Ala Leu Pro Ala Arg Glu Tyr Val Gly Leu
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 gaa cgc gat cag cgc ggt gag ttg gct gag ctg ttg gaa ggc ctg cac 1987
 Glu Arg Asp Gln Arg Gly Glu Leu Ala Glu Leu Leu Glu Gly Leu His
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 Thr Phe Val Ala Lys Thr Pro Ser Ala Leu Thr Cys Val Cys Leu Val
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 Asp Met Val Gly Glu Lys Arg Ala Gln Asn Gln Pro Gly Thr Thr Arg
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 Asp Met Tyr Pro Asn Trp Cys Ile Pro Leu Cys Asp Ser Glu Gly Asn
 665 670 675
 tcc gtg ctc att gaa tcg ctg cgt gaa aat gag ctg tat cac cgt gtg 2179
 Ser Val Leu Ile Glu Ser Leu Arg Glu Asn Glu Leu Tyr His Arg Val
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<213> *Corynebacterium glutamicum*

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 35 40 45
 Asp Ala Ile Gln Arg Gln Ile Ala Leu Phe His Asp Arg Glu Phe Thr
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 Arg Pro Leu Pro Pro Ser Val Val Ala Val Glu Gly Asp Glu Leu Val
 65 70 75 80
 Phe Pro Val His Val His Asp Gly Ser Pro Ala Asp Val His Ile Glu
 85 90 95
 Leu Glu Asp Gly Thr Gln Arg Asp Val Ser Gln Val Glu Asn Trp Thr

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[illegible]

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Gly	Ile	Arg	Ala	Glu	Ser	Ile	Ile	Gln	Val	Ser	Asp	Glu	Asp	Ala	Leu
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Ala	Phe	Pro	Glu	Asp	Lys	Leu	Lys	Thr	Tyr	Thr	Val	Leu	Val	Pro	Ala
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Tyr	Gly	Glu	Pro	Glu	Val	Ile	Ala	Gln	Leu	Leu	Ala	Ser	Met	His	Ala
	130					135					140				
Phe	Asp	Tyr	Pro	Lys	His	Leu	Leu	Gln	Val	Leu	Leu	Met	Leu	Glu	Glu
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Asp	Asp	Leu	Pro	Thr	Ile	Ala	Ala	Ala	Glu	Ala	Ala	Gly	Val	Asp	Gln
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Lys	Ala	Cys	Asn	Tyr	Gly	Leu	His	Phe	Ala	Thr	Gly	Glu	Ile	Val	Thr
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Arg	Leu	Ser	Tyr	Arg	Asn	Ala	Arg	Gln	Asn	Leu	Leu	Thr	Ala	Trp	Phe
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Ala	Val	Leu	Asp	Ser	Val	Thr	Trp	Glu	Glu	Ala	Asn	Ser	Asp	Thr	Ile
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Asn	Trp	Leu	Arg	Gln	Arg	Ser	Arg	Trp	Tyr	Lys	Gly	Tyr	Leu	Gln	Thr
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Trp	Leu	Val	Tyr	Met	Arg	Arg	Pro	Lys	Trp	Leu	Val	Gln	Glu	Leu	Gly
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Ile	Ile	Pro	Ala	Val	Arg	Phe	Thr	Phe	Leu	Met	Ala	Gly	Thr	Pro	Ile
	370					375					380				
Ile	Ala	Val	Leu	Asn	Leu	Leu	Phe	Trp	Tyr	Leu	Ser	Leu	Thr	Trp	Ile
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 Tyr Pro Ala Leu Val Cys Leu Val Val Ala Asn Ala Ala Thr Ile Phe
 420 425 430
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 435 440 445
 Ala Val Leu Thr Phe Pro Leu Tyr Trp Leu Leu Met Ser Ile Ala Ala
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 Thr Ser Asn His Leu Leu Thr Gly Val Leu Lys Asp Leu Gly Ala Trp
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 Asp Pro Phe Asn Val Thr Glu Asp Ala Asp Leu Gly Val Arg Ile Ala
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 Ala Lys Gly Tyr Ser Thr Ala Val Leu Asp Ser Val Thr Trp Glu Glu
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 gca aac tcc gac acc atc aac tgg ttg cgc cag cgt tct cgc tgg tac 243
 Ala Asn Ser Asp Thr Ile Asn Trp Leu Arg Gln Arg Ser Arg Trp Tyr
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 aag ggc tat ctg caa aca tgg ctt gtg tat atg cgc agg cca aag tgg 291
 Lys Gly Tyr Leu Gln Thr Trp Leu Val Tyr Met Arg Arg Pro Lys Trp
 80 85 90
 tta gtc caa gag ctt ggc atc att cct gct gtg cgt ttt acc ttc ctc 339
 Leu Val Gln Glu Leu Gly Ile Ile Pro Ala Val Arg Phe Thr Phe Leu
 95 100 105
 atg gca ggc acc ccg atc att gcg gtg ctc aat ctg ctc ttt tgg tac 387
 Met Ala Gly Thr Pro Ile Ile Ala Val Leu Asn Leu Leu Phe Trp Tyr

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Leu Ser Leu Thr Trp Ile Leu Gly Gln Pro Gly Thr Ile Glu Gln Met
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ttc cca cct gcg gtg tac tac cca gcg ttg gtg tgt ttg gtg gtg gcc 483
Phe Pro Pro Ala Val Tyr Tyr Pro Ala Leu Val Cys Leu Val Val Ala
    140      145      150

aat gct gcg acc atc ttt atg aat ctc att ggc tgc cgg gaa ggc cgc 531
Asn Ala Ala Thr Ile Phe Met Asn Leu Ile Gly Cys Arg Glu Gly Arg
    160      165      170

gac ccc ttg ctg ctc atc gcg gtt ctc acg ttc ccg ctg tat tgg ctg 579
Asp Pro Leu Leu Leu Ile Ala Val Leu Thr Phe Pro Leu Tyr Trp Leu
    175      180      185

ctc atg agc att gca gcg ttg aaa ggc acg tgg caa ttg atc acg cga 627
Leu Met Ser Ile Ala Ala Leu Lys Gly Thr Trp Gln Leu Ile Thr Arg
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cca tcc tat tgg gag aaa act gcc cac gga ttg gag gcg taagcgggtgc 676
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Thr Glu Asp Ala Asp Leu Gly Val Arg Ile Ala Ala Lys Gly Tyr Ser
    35      40      45
Thr Ala Val Leu Asp Ser Val Thr Trp Glu Glu Ala Asn Ser Asp Thr
    50      55      60
Ile Asn Trp Leu Arg Gln Arg Ser Arg Trp Tyr Lys Gly Tyr Leu Gln
    65      70      75      80
Thr Trp Leu Val Tyr Met Arg Arg Pro Lys Trp Leu Val Gln Glu Leu
    85      90      95
Gly Ile Ile Pro Ala Val Arg Phe Thr Phe Leu Met Ala Gly Thr Pro
    100      105      110
Ile Ile Ala Val Leu Asn Leu Leu Phe Trp Tyr Leu Ser Leu Thr Trp
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Ile Leu Gly Gln Pro Gly Thr Ile Glu Gln Met Phe Pro Pro Ala Val
    130      135      140

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 Arg Trp Lys Val Leu Phe Asp Asp Tyr Ile Pro Pro Val Arg Val Leu
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 Val Ala Ala Ile Ile Val Ala Leu Ile Phe Val Phe Ile Ala Ala Thr
 65 70 75 80
 Val Glu Arg Thr Val Thr Asn Arg Tyr Arg Ser Ser Val Asp Gly Glu
 85 90 95
 Arg Val Pro Leu Ala Pro Lys Ile Val Met Ala Glu Thr Arg Gly Val
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 Phe His Gly Pro Ile Thr Ile Asn Val Leu Val Pro Ala His Asn Glu
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 Pro Pro Glu Arg Ile Val Val Val Ala Asp Asn Cys Thr Asp Glu Thr
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 Thr Glu Leu Ala Arg Ala Glu Gly Val Glu Val Leu Glu Thr Val Asn
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 Ser Asp Arg Ala Leu Met Ala Val Gly Gly Leu Phe Tyr Gly Glu Ser
 225 230 235 240
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                                         Met Asp Ile Ile Ile
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Cys Lys Asp Glu Gln Glu Val Gly Lys Ala Ala Ala Ala Leu Ile Ala
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Pro Phe Ala Thr Lys Gly Gly Thr Leu Gly Leu Ala Thr Gly Ser Ser
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cct ttg agc acc tac caa gag ctc att cgc atg tat gaa gct ggg gaa 259
Pro Leu Ser Thr Tyr Gln Glu Leu Ile Arg Met Tyr Glu Ala Gly Glu
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Val Ser Phe Lys Asn Cys Lys Ala Phe Leu Leu Asp Glu Tyr Val Gly
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Leu Thr Arg Asp Asp Glu Asn Ser Tyr Phe Lys Thr Ile Arg Lys Glu
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Gly His Ile Ala Phe Asn Glu Pro Ser Ser Ser Leu Ser Gly Leu Thr
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Lys Val Gln Ala Leu His Pro Lys Thr Val Glu Asp Asn Ala Arg Phe
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Phe Asn Thr Ile Glu Glu Val Pro Thr His Ala Leu Thr Gln Gly Leu
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 Met Cys Pro Gly Ser Ile Leu Gln Met His Asn Asn Ala Thr Ile Ile
 215 220 225

gtt gat gaa gca gca gca tcc aag ctg gaa aac gct gat cac tac cgt 835
 Val Asp Glu Ala Ala Ala Ser Lys Leu Glu Asn Ala Asp His Tyr Arg
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ctc atg gag caa tta aag ctg cgc tagaaacaaa aaggaaagta gtg 882
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 35 40 45

Tyr Glu Ala Gly Glu Val Ser Phe Lys Asn Cys Lys Ala Phe Leu Leu
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Asp Glu Tyr Val Gly Leu Thr Arg Asp Asp Glu Asn Ser Tyr Phe Lys
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Thr Ile Arg Lys Glu Phe Thr Asp His Ile Asp Ile Val Asp Glu Glu
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Val Tyr Ser Pro Asp Gly Ala Asn Pro Asp Pro Tyr Glu Ala Ala Ala
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Glu Tyr Glu Ala Lys Ile Ala Ala Glu Ser Val Asp Val Gln Ile Leu
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Gly Ile Gly Gly Asn Gly His Ile Ala Phe Asn Glu Pro Ser Ser Ser
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Leu Ser Gly Leu Thr Lys Val Gln Ala Leu His Pro Lys Thr Val Glu
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Asp Asn Ala Arg Phe Phe Asn Thr Ile Glu Glu Val Pro Thr His Ala
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SECRET

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ttc	ctg	ctg	tcc	gaa	ctt	gtt	gca	gcg	aat	gag	aaa	ttc	ttc	gcc	gac	691				
Phe	Leu	Leu	Ser	Glu	Leu	Val	Ala	Ala	Asn	Glu	Lys	Phe	Phe	Ala	Asp					
			185					190					195							
ccc	aac	cca	ggc	ttc	atc	cca	acc	gat	gac	gcc	agc	ttg	atg	gaa	tgg	739				
Pro	Asn	Pro	Gly	Phe	Ile	Pro	Thr	Asp	Asp	Ala	Ser	Leu	Met	Glu	Trp					
		200					205					210								
tac	ggc	gca	gat	gta	gtc	tgc	gta	caa	ggc	gac	cca	atg	gcg	ttt	aaa	787				
Tyr	Gly	Ala	Asp	Val	Val	Cys	Val	Gln	Gly	Asp	Pro	Met	Ala	Phe	Lys					
	215					220				225										
gta	aca	acc	ccc	att	gat	atg	atg	ctg	gca	caa	cgc	atc	acc	gac	gaa	835				
Val	Thr	Thr	Pro	Ile	Asp	Met	Met	Leu	Ala	Gln	Arg	Ile	Thr	Asp	Glu					
230					235					240				245						
gcc	gaa	ccc	aca	ata	ttt	gag	gta	cca	ggt	gac	taacccaatc	atcccccgcg				888				
Ala	Glu	Pro	Thr	Ile	Phe	Glu	Val	Pro	Gly	Asp										
				250					255											
tag																891				

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<211> 256

<212> PRT

<213> Corynebacterium glutamicum

<400> 438

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Arg	Gly	Thr	Arg	Leu	Gly	Gly	Pro	Ile	Pro	Lys	Ala	Phe	Val	Thr	Leu
			20					25					30		

Arg	Glu	Arg	Thr	Leu	Leu	Glu	Arg	Ser	Leu	Gln	Ala	Met	Leu	Thr	Ser
		35					40					45			

Glu	Ser	Val	Asp	Glu	Ile	Ile	Ile	Leu	Val	Ser	Pro	Asp	Met	Glu	Thr
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

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[illegible]

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aaacaaaacc tctaagtaat tcttgaaagg aaattttcac atg tac gct cgt aaa 115
                                         Met Tyr Ala Arg Lys
                                         1                               5
ctt att gct ctg tcc gct tct gtc gtt ttg gct ttc agc ttg tct gct 163
Leu Ile Ala Leu Ser Ala Ser Val Val Leu Ala Phe Ser Leu Ser Ala

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	10	15	20	
tgc aac cgt gaa tct tct ggc acc agc gca gac ggc ggt tct gcg gat	25	30	35	211
Cys Asn Arg Glu Ser Ser Gly Thr Ser Ala Asp Gly Gly Ser Ala Asp				
ggg tcg atc acc ttg gct ctg tct acc cag acc aac ccg ttc ttt gtg	40	45	50	259
Gly Ser Ile Thr Leu Ala Leu Ser Thr Gln Thr Asn Pro Phe Phe Val				
cag ctt cgt gat ggt gcc cag gaa aag gct gat gaa ttg ggc gtg acc	55	60	65	307
Gln Leu Arg Asp Gly Ala Gln Glu Lys Ala Asp Glu Leu Gly Val Thr				
ctc aat gtt cag gat gct tcc gat gac gct gca acg cag gcc aac cag	70	75	80	355
Leu Asn Val Gln Asp Ala Ser Asp Asp Ala Ala Thr Gln Ala Asn Gln				
ctc aac aac gct gtc acc acc ggt gct ggc gtg gtg att gtc aac cca	90	95	100	403
Leu Asn Asn Ala Val Thr Thr Gly Ala Gly Val Val Ile Val Asn Pro				
act gat tct gat gct gtg gtg ccg tcg gtg gaa gct ctc aac cag gct	105	110	115	451
Thr Asp Ser Asp Ala Val Val Pro Ser Val Glu Ala Leu Asn Gln Ala				
gac att cct gtt gtg gct gtc gac cgt tcc tcc aat ggt ggc gag gtg	120	125	130	499
Asp Ile Pro Val Val Ala Val Asp Arg Ser Ser Asn Gly Gly Glu Val				
gcg tcc ttc gtg gca tct gac aac gtt gct ggc ggc gcg cag gct gct	135	140	145	547
Ala Ser Phe Val Ala Ser Asp Asn Val Ala Gly Gly Ala Gln Ala Ala				
gca gcc ctg gca gag gcg atc ggt ggc gaa ggt gaa atc ctc atg ctg	150	155	160	595
Ala Ala Leu Ala Glu Ala Ile Gly Gly Glu Gly Glu Ile Leu Met Leu				
caa ggc att gcg gga tcc tct gca tca cgt gat cgt gga cag gga ttt	170	175	180	643
Gln Gly Ile Ala Gly Ser Ser Ala Ser Arg Asp Arg Gly Gln Gly Phe				
gaa gag gag atc gct aag cat gag ggc att tcc att gtg gct aag cag	185	190	195	691
Glu Glu Glu Ile Ala Lys His Glu Gly Ile Ser Ile Val Ala Lys Gln				
acc gcc aac ttt gac cgc ggt gag ggc ctg gac gtg gca act aac ctg	200	205	210	739
Thr Ala Asn Phe Asp Arg Gly Glu Gly Leu Asp Val Ala Thr Asn Leu				
ctg cag gca cac ccc aat gtg aag gcg atc ttc gcg gaa aac gat gag	215	220	225	787
Leu Gln Ala His Pro Asn Val Lys Ala Ile Phe Ala Glu Asn Asp Glu				
atg gcg ttg ggc gca atc gaa gcc ctg ggt gct cgt gct ggt gaa gat	230	235	240	835
Met Ala Leu Gly Ala Ile Glu Ala Leu Gly Ala Arg Ala Gly Glu Asp				
gtc atc gtt gtc ggt ttc gat ggc acc aat gat ggt ctg gca gcg gtt	250	255	260	883
Val Ile Val Val Gly Phe Asp Gly Thr Asn Asp Gly Leu Ala Ala Val				

00502740 062300

gaa gat gga cgc atg ttg gcc acc gtt gct cag cag cca gaa gag ctg 931
 Glu Asp Gly Arg Met Leu Ala Thr Val Ala Gln Gln Pro Glu Glu Leu
 265 270 275
 gga gca aag gct gtg gaa gaa gca gct aag ctc ctg cgc ggt gag gac 979
 Gly Ala Lys Ala Val Glu Glu Ala Ala Lys Leu Leu Arg Gly Glu Asp
 280 285 290
 gct gaa aca gag gta cca gtt gag gtt gtc act gtg aag ctc gac aac 1027
 Ala Glu Thr Glu Val Pro Val Glu Val Val Thr Val Lys Leu Asp Asn
 295 300 305
 gtc gcg gac ttc aag tagtcggcga tgaaaaagtc cgt 1065
 Val Ala Asp Phe Lys
 310

<210> 440

<211> 314

<212> PRT

<213> Corynebacterium glutamicum

<400> 440

Met Tyr Ala Arg Lys Leu Ile Ala Leu Ser Ala Ser Val Val Leu Ala
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 Phe Ser Leu Ser Ala Cys Asn Arg Glu Ser Ser Gly Thr Ser Ala Asp
 20 25 30
 Gly Gly Ser Ala Asp Gly Ser Ile Thr Leu Ala Leu Ser Thr Gln Thr
 35 40 45
 Asn Pro Phe Phe Val Gln Leu Arg Asp Gly Ala Gln Glu Lys Ala Asp
 50 55 60
 Glu Leu Gly Val Thr Leu Asn Val Gln Asp Ala Ser Asp Asp Ala Ala
 65 70 75 80
 Thr Gln Ala Asn Gln Leu Asn Asn Ala Val Thr Thr Gly Ala Gly Val
 85 90 95
 Val Ile Val Asn Pro Thr Asp Ser Asp Ala Val Val Pro Ser Val Glu
 100 105 110
 Ala Leu Asn Gln Ala Asp Ile Pro Val Val Ala Val Asp Arg Ser Ser
 115 120 125
 Asn Gly Gly Glu Val Ala Ser Phe Val Ala Ser Asp Asn Val Ala Gly
 130 135 140
 Gly Ala Gln Ala Ala Ala Ala Leu Ala Glu Ala Ile Gly Gly Glu Gly
 145 150 155 160
 Glu Ile Leu Met Leu Gln Gly Ile Ala Gly Ser Ser Ala Ser Arg Asp
 165 170 175
 Arg Gly Gln Gly Phe Glu Glu Glu Ile Ala Lys His Glu Gly Ile Ser
 180 185 190
 Ile Val Ala Lys Gln Thr Ala Asn Phe Asp Arg Gly Glu Gly Leu Asp

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<400> 441																
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aggcggagga accgtcgata cgcctcggtt ggttgtcgcg atg gtg agc cac ggc																115
Met Val Ser His Gly																5
1																
gcg ccg ggc gat act ttt tgg gat ttg gtc cga aaa ggt gct gaa gac	163															
Ala Pro Gly Asp Thr Phe Trp Asp Leu Val Arg Lys Gly Ala Glu Asp																
10 15 20																
gcc gcc caa aaa gac aac gtt gaa ctc cgc tat tcc tct aat ccg gaa																211
Ala Ala Gln Lys Asp Asn Val Glu Leu Arg Tyr Ser Ser Asn Pro Glu																
25 30 35																
atc cct gaa caa tcc aac ctc gtg caa aat gcc atc gat tca cgc gtc																259
Ile Pro Glu Gln Ser Asn Leu Val Gln Asn Ala Ile Asp Ser Arg Val																
40 45 50																
gac ggc atc gcc atg acc atg cct aat gct caa tca cta gga ccg gtc																307
Asp Gly Ile Ala Met Thr Met Pro Asn Ala Gln Ser Leu Gly Pro Val																
55 60 65																
gct caa aag gcc gtg gat gcg ggc att cct gtg gtt ggt ctc aac gct																355
Ala Gln Lys Ala Val Asp Ala Gly Ile Pro Val Val Gly Leu Asn Ala																
70 75 80 85																


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<210> 443
<211> 1482
<212> DNA
<213> Corynebacterium glutamicum
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<222> (101)..(1459)
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<223> RXN01569

<400> 443

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agaacaacgt cgaagctacc tacgctaagc agggacaata atg gaa tac ggt aaa 115
                                         Met Glu Tyr Gly Lys
                                         1                               5

caa ctc acc tcc cac acc acc gac atc gaa ggc cta ctg gtt ttc gat 163
Gln Leu Thr Ser His Thr Thr Asp Ile Glu Gly Leu Leu Val Phe Asp
                        10                        15                        20

ttc ccc gtc cac ggc gac aac cgc ggc tgg ttc aag gaa aat tgg cag 211
Phe Pro Val His Gly Asp Asn Arg Gly Trp Phe Lys Glu Asn Trp Gln
                        25                        30                        35

cgc acc aag atg acc aac ctg ggg ctg ccc gat ttt ggc ccc gtc caa 259
Arg Thr Lys Met Thr Asn Leu Gly Leu Pro Asp Phe Gly Pro Val Gln
                        40                        45                        50

aac aac atg agt ttc aac gcc acc gcc ggc acg act cgc ggc atg cac 307
Asn Asn Met Ser Phe Asn Ala Thr Ala Gly Thr Thr Arg Gly Met His
                        55                        60                        65

gct gag ccg tgg gat aaa ttt gtg tcc gtc gcg gtg ggt tcc gtt ttc 355
Ala Glu Pro Trp Asp Lys Phe Val Ser Val Ala Val Gly Ser Val Phe
      70                        75                        80                        85

gga gct tgg gtg gat ctg cgc gcg ggc tcg agc acg tac ggt aac gtc 403
Gly Ala Trp Val Asp Leu Arg Ala Gly Ser Ser Thr Tyr Gly Asn Val
                        90                        95                        100

gta acg caa aaa att acc cct gac gtg gga gtt tac gtc ccg cgt ggt 451
Val Thr Gln Lys Ile Thr Pro Asp Val Gly Val Tyr Val Pro Arg Gly
                        105                        110                        115

gtg gca aac ggc ttc cag gcg ctc gag gac ggc acg ctg tac acc tac 499
Val Ala Asn Gly Phe Gln Ala Leu Glu Asp Gly Thr Leu Tyr Thr Tyr
                        120                        125                        130

ctc gtc aac gat cat tgg tcc ccc gac gcg cat tac gcc aac gtc aac 547
Leu Val Asn Asp His Trp Ser Pro Asp Ala His Tyr Ala Asn Val Asn
      135                        140                        145

ctc aac atg atc gac tgg ccg ctg ccc atc acc gag atc tcc gaa aaa 595
Leu Asn Met Ile Asp Trp Pro Leu Pro Ile Thr Glu Ile Ser Glu Lys
      150                        155                        160                        165

gat aaa aaa cat cca gcg ctt atc gac gcc acc ccc ctg ccc gcc cgc 643
Asp Lys Lys His Pro Ala Leu Ile Asp Ala Thr Pro Leu Pro Ala Arg
                        170                        175                        180

aag gtt ctc gtg gtc ggc gcc ggc gga caa ctg gga acc gcg cta cgc 691
Lys Val Leu Val Val Gly Ala Gly Gly Gln Leu Gly Thr Ala Leu Arg
                        185                        190                        195

gcg cag ttc cca gac gcg gaa ttt gtc acg cgc caa gaa ctc gat atc 739
Ala Gln Phe Pro Asp Ala Glu Phe Val Thr Arg Gln Glu Leu Asp Ile
                        200                        205                        210

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006290-0720960

<210> 444

<211> 453

<212> PRT

<213> *Corynebacterium glutamicum*

<400> 444

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 1 5 10 15

Leu Leu Val Phe Asp Phe Pro Val His Gly Asp Asn Arg Gly Trp Phe
 20 25 30

Lys Glu Asn Trp Gln Arg Thr Lys Met Thr Asn Leu Gly Leu Pro Asp
 35 40 45

Phe Gly Pro Val Gln Asn Asn Met Ser Phe Asn Ala Thr Ala Gly Thr
 50 55 60

Thr Arg Gly Met His Ala Glu Pro Trp Asp Lys Phe Val Ser Val Ala
 65 70 75 80

Val Gly Ser Val Phe Gly Ala Trp Val Asp Leu Arg Ala Gly Ser Ser
 85 90 95

Thr Tyr Gly Asn Val Val Thr Gln Lys Ile Thr Pro Asp Val Gly Val
 100 105 110

Tyr Val Pro Arg Gly Val Ala Asn Gly Phe Gln Ala Leu Glu Asp Gly
 115 120 125

Thr Leu Tyr Thr Tyr Leu Val Asn Asp His Trp Ser Pro Asp Ala His
 130 135 140

Tyr Ala Asn Val Asn Leu Asn Met Ile Asp Trp Pro Leu Pro Ile Thr
 145 150 155 160

Glu Ile Ser Glu Lys Asp Lys Lys His Pro Ala Leu Ile Asp Ala Thr
 165 170 175

Pro Leu Pro Ala Arg Lys Val Leu Val Val Gly Ala Gly Gly Gln Leu
 180 185 190

Gly Thr Ala Leu Arg Ala Gln Phe Pro Asp Ala Glu Phe Val Thr Arg
 195 200 205

Gln Glu Leu Asp Ile Thr Ser Asp Leu Thr Glu Ala Arg Ala Trp Lys
 210 215 220

Gln Tyr Ser Thr Ile Ile Asn Ala Ala Ala Tyr Thr Ala Val Asp Gln
 225 230 235 240

Ala Glu His Asp Arg Ala Ala Ala Trp Asp Ile Asn Ala Ala Ala Val
 245 250 255

Ala Asn Leu Ala Thr Ile Ala Arg Asp Asn Asn Leu Thr Leu Val His
 260 265 270

Val Ser Ser Asp Tyr Val Phe Asp Gly Ala Ala Glu Ser Tyr Asp Glu
 275 280 285

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gcg cag ttc cca gac gcg gaa ttt gtc acg cgc caa gaa ctc gat atc 739
 Ala Gln Phe Pro Asp Ala Glu Phe Val Thr Arg Gln Glu Leu Asp Ile
 200 205 210

acc tca gat ctc acc gag gct cgc gcg tgg aaa caa tac tcc acc atc 787
 Thr Ser Asp Leu Thr Glu Ala Arg Ala Trp Lys Gln Tyr Ser Thr Ile
 215 220 225

ata aac gcc gcc gcc tac act gcc gtt gac cag gca gaa cac gac cgc 835
 Ile Asn Ala Ala Ala Tyr Thr Ala Val Asp Gln Ala Glu His Asp Arg
 230 235 240 245

gca gca gcg tgg gac att aac gca gcg gca gtg gct acc tcg cga cca 883
 Ala Ala Ala Trp Asp Ile Asn Ala Ala Val Ala Thr Ser Arg Pro
 250 255 260

tcg cgc gcg aca aca acc tca ccc tcg tgc acg tgt cct cag att atg 931
 Ser Arg Ala Thr Thr Thr Ser Pro Ser Cys Thr Cys Pro Gln Ile Met
 265 270 275

tct tcg acg gtg cgg gcg aat cct acg atg aaa acg cac cgt ttt ccc 979
 Ser Ser Thr Val Arg Ala Asn Pro Thr Met Lys Thr His Arg Phe Pro
 280 285 290

cac tcg gcg tgt acg gcc aat cca aag cag ccg gcg aca tcg 1021
 His Ser Ala Cys Thr Ala Asn Pro Lys Gln Pro Ala Thr Ser
 295 300 305

taagcac 1028

<210> 448
 <211> 307
 <212> PRT
 <213> Corynebacterium glutamicum

<400> 448
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Leu Leu Val Phe Asp Phe Pro Val His Gly Asp Asn Arg Gly Trp Phe
 20 25 30

Lys Glu Asn Trp Gln Arg Thr Lys Met Thr Asn Leu Gly Leu Pro Asp
 35 40 45

Phe Gly Pro Val Gln Asn Asn Met Ser Phe Asn Ala Thr Ala Gly Thr
 50 55 60

Thr Arg Gly Met His Ala Glu Pro Trp Asp Lys Phe Val Ser Val Ala
 65 70 75 80

Val Gly Ser Val Phe Gly Ala Trp Val Asp Leu Arg Ala Gly Ser Ser
 85 90 95

Thr Tyr Gly Asn Val Val Thr Gln Lys Ile Thr Pro Asp Val Gly Val
 100 105 110

Tyr Val Pro Arg Gly Val Ala Asn Gly Phe Gln Ala Leu Glu Asp Gly
 115 120 125

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atc ggc acc ttt gtc ctg cta gaa gca gtc cgc aag cac aac aaa cgc 451
 Ile Gly Thr Phe Val Leu Leu Glu Ala Val Arg Lys His Asn Lys Arg
 105 110 115

ttc cac cac atc tcc acc gat gaa gtc ttc ggc gat cta gag ctg gat 499
 Phe His His Ile Ser Thr Asp Glu Val Phe Gly Asp Leu Glu Leu Asp
 120 125 130

gat cca aac cgc ttc act gaa acc acc gcc tac aag cca tcg tct cca 547
 Asp Pro Asn Arg Phe Thr Glu Thr Thr Ala Tyr Lys Pro Ser Ser Pro
 135 140 145

tat tct gca acc aag gca ggg tct gat cac ttg gta cac gca tgg atc 595
 Tyr Ser Ala Thr Lys Ala Gly Ser Asp His Leu Val His Ala Trp Ile
 150 155 160 165

cgc tcc ttc gga atc cag gca acc atg tct aac tgc tcc aac aat tac 643
 Arg Ser Phe Gly Ile Gln Ala Thr Met Ser Asn Cys Ser Asn Asn Tyr
 170 175 180

ggt ccc tac cag cac att gaa aag ttc atc ccc cgc cag atc acc aat 691
 Gly Pro Tyr Gln His Ile Glu Lys Phe Ile Pro Arg Gln Ile Thr Asn
 185 190 195

att ctg gcc ggc ctg aca cca aaa ctt tat gga acc ggc gag cag gtc 739
 Ile Leu Ala Gly Leu Thr Pro Lys Leu Tyr Gly Thr Gly Glu Gln Val
 200 205 210

cgc gac tgg atc cac gtc gat gat cac aat gac gcc gtc cac ctg atc 787
 Arg Asp Trp Ile His Val Asp Asp His Asn Asp Ala Val His Leu Ile
 215 220 225

ctg agt aag ggc aag atc ggc gaa acc tac atc atc ggc gcc gac aac 835
 Leu Ser Lys Gly Lys Ile Gly Glu Thr Tyr Ile Ile Gly Ala Asp Asn
 230 235 240 245

gat cat gtg aat aac aag cag gtc atc gag ctt att tgt gaa ctc atg 883
 Asp His Val Asn Asn Lys Gln Val Ile Glu Leu Ile Cys Glu Leu Met
 250 255 260

ggc ctc gac aaa aac gca tac gag cac gtc gca gac cgc ccc ggc cac 931
 Gly Leu Asp Lys Asn Ala Tyr Glu His Val Ala Asp Arg Pro Gly His
 265 270 275

gat atg cgt tac gcc atg gat tcc acc aag ctg cgc acc gag ctc ggc 979
 Asp Met Arg Tyr Ala Met Asp Ser Thr Lys Leu Arg Thr Glu Leu Gly
 280 285 290

tgg gca cct aaa tac acc gac gtt gat tcc ggc atg cgc aaa ggc cta 1027
 Trp Ala Pro Lys Tyr Thr Asp Val Asp Ser Gly Met Arg Lys Gly Leu
 295 300 305

gag cag acc atc gat tgg tac cgc gaa aac gag gcc tgg tgg cgc cct 1075
 Glu Gln Thr Ile Asp Trp Tyr Arg Glu Asn Glu Ala Trp Trp Arg Pro
 310 315 320 325

gcc aag aac aac gtc gaa gct acc tac gct aag cag gga caa 1117
 Ala Lys Asn Asn Val Glu Ala Thr Tyr Ala Lys Gln Gly Gln
 330 335

taatggaata cggtaaacaa ctc 1140

002290" 04220960

<210> 452
 <211> 339
 <212> PRT
 <213> Corynebacterium glutamicum

<400> 452
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 Phe Val Arg Gln Thr Val Glu Gln His Pro Glu Tyr Thr His Ile Thr
 20 25 30
 Val Leu Asp Lys Leu Thr Tyr Ala Gly Asn Ala Asp Asn Leu Lys Gly
 35 40 45
 Leu Pro Asp Ser Lys Val Thr Leu Ile Glu Gly Asp Ile Cys Asp Ala
 50 55 60
 Glu Leu Val Asp Ser Leu Val Lys Asp His Asp Ile Thr Val His Phe
 65 70 75 80
 Ala Ala Glu Ser His Asn Asp Asn Ser Leu Asn Asp Pro Ser Pro Phe
 85 90 95
 Val His Thr Asn Leu Ile Gly Thr Phe Val Leu Leu Glu Ala Val Arg
 100 105 110
 Lys His Asn Lys Arg Phe His His Ile Ser Thr Asp Glu Val Phe Gly
 115 120 125
 Asp Leu Glu Leu Asp Asp Pro Asn Arg Phe Thr Glu Thr Thr Ala Tyr
 130 135 140
 Lys Pro Ser Ser Pro Tyr Ser Ala Thr Lys Ala Gly Ser Asp His Leu
 145 150 155 160
 Val His Ala Trp Ile Arg Ser Phe Gly Ile Gln Ala Thr Met Ser Asn
 165 170 175
 Cys Ser Asn Asn Tyr Gly Pro Tyr Gln His Ile Glu Lys Phe Ile Pro
 180 185 190
 Arg Gln Ile Thr Asn Ile Leu Ala Gly Leu Thr Pro Lys Leu Tyr Gly
 195 200 205
 Thr Gly Glu Gln Val Arg Asp Trp Ile His Val Asp Asp His Asn Asp
 210 215 220
 Ala Val His Leu Ile Leu Ser Lys Gly Lys Ile Gly Glu Thr Tyr Ile
 225 230 235 240
 Ile Gly Ala Asp Asn Asp His Val Asn Asn Lys Gln Val Ile Glu Leu
 245 250 255
 Ile Cys Glu Leu Met Gly Leu Asp Lys Asn Ala Tyr Glu His Val Ala
 260 265 270
 Asp Arg Pro Gly His Asp Met Arg Tyr Ala Met Asp Ser Thr Lys Leu
 275 280 285

002290.0720960

<400> 453																
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aatcaaacct atccggtgaa acacattgtg gtggtggata atg ggg cgg atc cta 115																
Met Gly Arg Ile Leu 5																
gta ttc tat agt gtc act tta gag gtg gcg gga gac cgt ccc gtt tac 163																
Val Phe Tyr Ser Val Thr Leu Glu Val Ala Gly Asp Arg Pro Val Tyr 20																
acg cct tcg cgc acc aat ttg ggc gac ggt ggc ggt ttt gct ttt ggt 211																
Thr Pro Ser Arg Thr Asn Leu Gly Asp Gly Gly Gly Phe Ala Phe Gly 35																
ttt ttg acg gcg ttg gcg ctg ggg gcg aac gcg gtg tgg tgc aca gac 259																
Phe Leu Thr Ala Leu Ala Leu Gly Ala Asn Ala Val Trp Cys Thr Asp 50																
gat gac ggc cgg ccg gag ggg cca ggg gtg ttg aag acg ctt atc gac 307																
Asp Asp Gly Arg Pro Glu Gly Pro Gly Val Leu Lys Thr Leu Ile Asp 65																
gcc gct tct cgg cat aat ctg gag gag gtt tct ccg gtg gta tgc aat 355																
Ala Ala Ser Arg His Asn Leu Glu Glu Val Ser Pro Val Val Cys Asn 85																
gct gat gat ccg gag cgg ttg gca ttt ccg ctg cgt cgg ggc ttg gag 403																
Ala Asp Asp Pro Glu Arg Leu Ala Phe Pro Leu Arg Arg Gly Leu Glu 100																
tgg cgt cgg atg cgc agt gag ttg att gat cca gcc aac ccg gag gat 451																
Trp Arg Arg Met Arg Ser Glu Leu Ile Asp Pro Ala Asn Pro Glu Asp 115																
gat ttg ctg ccg ggc atc gcc tcc ttg ttc aat ggt gcc ctg atc agc 499																
Asp Leu Leu Pro Gly Ile Ala Ser Leu Phe Asn Gly Ala Leu Ile Ser																

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<400> 454
Met Gly Arg Ile Leu Val Phe Tyr Ser Val Thr Leu Glu Val Ala Gly
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Asp Arg Pro Val Tyr Thr Pro Ser Arg Thr Asn Leu Gly Asp Gly Gly
          20          25          30
Gly Phe Ala Phe Gly Phe Leu Thr Ala Leu Ala Leu Gly Ala Asn Ala
          35          40          45
Val Trp Cys Thr Asp Asp Asp Gly Arg Pro Glu Gly Pro Gly Val Leu
          50          55          60
Lys Thr Leu Ile Asp Ala Ala Ser Arg His Asn Leu Glu Glu Val Ser
  65          70          75          80
Pro Val Val Cys Asn Ala Asp Asp Pro Glu Arg Leu Ala Phe Pro Leu

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Figure 1: Schematic representation of the experimental design. The figure shows a vertical sequence of steps: 1. Pretest (N=10), 2. Main Experiment (N=100), 3. Posttest (N=10), 4. Follow-up (N=10), 5. Debriefing (N=10). Each step is represented by a box with a number and a description. Arrows indicate the flow from Pretest to Main Experiment, Main Experiment to Posttest, Posttest to Follow-up, and Follow-up to Debriefing.

acc acg gcg tat ttg cac ccg gat ggt tct gat gag ttc aag ccg att 307
Thr Thr Ala Tyr Leu His Pro Asp Gly Ser Asp Glu Phe Lys Pro Ile
55 60 65

ctg ggt ggg cgg atg cat acg cag tat ccg gat aat gat ttc aag agg 355
Leu Gly Gly Arg Met His Thr Gln Tyr Pro Asp Asn Asp Phe Lys Arg
70 75 80 85

ttt ttc acc tac cgc aac cgt ggc tac ctg atg agc cag ccg gga atg 403
Phe Phe Thr Tyr Arg Asn Arg Gly Tyr Leu Met Ser Gln Pro Gly Met
90 95 100

cgc aag ctt ctc cct cag gaa tat gcg cgc ttt gcg tgg ttc ttc ctg 451
 Arg Lys Leu Leu Pro Gln Glu Tyr Ala Arg Phe Ala Trp Phe Phe Leu
 105 110 115

gtt cag aaa cgg gat gtg aag gga ttc cgg gag tgg ctg cgc ctg cac 499
Val Gln Lys Arg Asp Val Lys Gly Phe Arg Glu Trp Leu Arg Leu His
120 125 130

aaa ctg ggc cgc gac gag aaa ttc aat agg ccc tagatcagtt ttagtagttc 552
Lys Leu Gly Arg Asp Glu Lys Phe Asn Arg Pro
135 140

ctc 555

<210> 456

<211> 144

<212> PRT

<213> Corynebacterium glutamicum

<400> 456

Leu Leu Pro Gly Ile Ala Ser Leu Phe Asn Gly Ala Leu Ile Ser Ala
1 5 10 15

Tyr Ala Met Glu Arg Ile Gly Val Pro Asp Tyr Arg Leu Phe Ile Arg
20 25 30

Gly Asp Glu Val Glu Tyr His Arg Arg Leu Val Arg Ser Gly Leu Pro
35 40 45

Phe Gly Thr Cys Leu Thr Thr Ala Tyr Leu His Pro Asp Gly Ser Asp
50 55 60

Glu Phe Lys Pro Ile Leu Gly Gly Arg Met His Thr Gln Tyr Pro Asp
65 70 75 80

Asn Asp Phe Lys Arg Phe Phe Thr Tyr Arg Asn Arg Gly Tyr Leu Met
85 90 95

Ser Gln Pro Gly Met Arg Lys Leu Leu Pro Gln Glu Tyr Ala Arg Phe
100 105 110

Ala Trp Phe Phe Leu Val Gln Lys Arg Asp Val Lys Gly Phe Arg Glu
115 120 125

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099
1990	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099

$\langle 210 \rangle$	458
$\langle 211 \rangle$	128

THE **WORLD'S** **LARGEST** **BOOKSTORE**

<212> PRT

<213> Corynebacterium glutamicum

<400> 458

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Met Ile Gln Ala Ala Leu Trp Ile Val Leu Phe Leu Phe Ala Asp Arg
 1             5             10             15

Leu Ser Asn Pro Leu Val Phe Val Ser Ala Ile Met Phe Ala Ile Ser
          20             25             30

Phe Ser Ser Pro Val Ala Asn Phe Gly Phe Asp Thr Ile Cys Glu Lys
          35             40             45

Leu Asp Arg Arg Val Met Val Ala Gly Thr Gly Met Ala Asn Met Ser
 50             55             60

Ala Tyr Ile Cys Ala Met Leu Ala Thr Gln Ile Ile Gly Phe Leu Leu
 65             70             75             80

Asp Trp Asn Ala Asp Gly His Ala Tyr Thr Trp Ser Asn Phe Gln Val
          85             90             95

Ala Trp Leu Gly Leu Gly Ala Val Trp Leu Ala Gly Met Ile Gly Leu
          100             105             110

Ala Val Cys Leu Leu Leu Gln Arg Arg Lys Asn Ile Ala Phe Arg Arg
 115             120             125

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<210> 459

<211> 615

<212> DNA

<213> Corynebacterium glutamicum

<220>

<221> CDS

<222> (101)..(592)

<223> RXA00328

<400> 459

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attaggtcta ccaaggactt tttaaagatcg ggtaaaacct gtg ggc gtt gaa agg 115
                               Val Gly Val Glu Arg
                               1             5

ggc aag gtc tct gcc aag gca cta gtt gtc tgg ttg acg gca atg tgc 163
Gly Lys Val Ser Ala Lys Ala Leu Val Val Trp Leu Thr Ala Met Cys
          10             15             20

gtg tac atc gtg gcc att gct ggt cga aca tca ttt ggt gtc gcc gga 211
Val Tyr Ile Val Ala Ile Ala Gly Arg Thr Ser Phe Gly Val Ala Gly
          25             30             35

gtg cat gcg atc gat cgc ttt gat atc gac gcc tcc cgg ttg gcc gtg 259
Val His Ala Ile Asp Arg Phe Asp Ile Asp Ala Ser Arg Leu Ala Val
          40             45             50

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00E290" 04220960

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<210> 460
<211> 164
<212> PRT
<213> Corynebacterium glutamicum
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<400> 460																
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1				5					10					15		
Leu	Thr	Ala	Met	Cys	Val	Tyr	Ile	Val	Ala	Ile	Ala	Gly	Arg	Thr	Ser	
			20					25					30			
Phe	Gly	Val	Ala	Gly	Val	His	Ala	Ile	Asp	Arg	Phe	Asp	Ile	Asp	Ala	
		35					40					45				
Ser	Arg	Leu	Ala	Val	Phe	Thr	Ser	Val	Gln	Val	Gly	Val	Tyr	Val	Leu	
	50					55					60					
Ala	Gln	Ile	Pro	Met	Gly	Met	Leu	Val	Asp	Arg	Phe	Asp	Ala	Arg	Lys	
65					70					75					80	
Leu	Leu	Leu	Ala	Gly	Ala	Leu	Ile	Leu	Ala	Ala	Gly	Gln	Leu	Ile	Leu	
				85					90					95		
Gly	Phe	Thr	Asp	Ser	Tyr	Met	Ile	Ala	Ile	Phe	Ala	Arg	Val	Leu	Ile	
			100					105					110			
Ser	Val	Gly	Asp	Ser	Ser	Ala	Phe	Leu	Ser	Val	Met	Arg	Leu	Leu	Pro	
		115					120					125				

Asn Trp Phe Pro Met Ser Trp Thr Pro Val Leu Gln Gln Leu Thr Gly
130 135 140

Ala Phe Gly Phe Val Gly Gln Phe Ser Pro Arg Cys Arg Phe Cys Thr
145 150 155 160

Tyr Ser Thr Pro

<210> 461

<211> 1347

<212> DNA

<213> Corynebacterium glutamicum

<220>

<221> CDS

<222> (101)..(1324)

<223> RXA00329

<400> 461

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ccgcgccctc atagtttggg cagcagcctg tcttgtgtat atg gca gcc att acc 115
Met Ala Ala Ile Thr
1 5

agc cgc acc agc ttt ggt gtg gct gga gtg gag gcc att gat cgt ttt 163
Ser Arg Thr Ser Phe Gly Val Ala Gly Val Glu Ala Ile Asp Arg Phe
10 15 20

cag gta gac gcc aca cgc att gca gta ttc act tct gtt cag gtt ggt 211
Gln Val Asp Ala Thr Arg Ile Ala Val Phe Thr Ser Val Gln Val Gly
25 30 35

gtg tac gcg ttt gct cag att ccg atg ggc att ttg atc gat aag ttt 259
Val Tyr Ala Phe Ala Gln Ile Pro Met Gly Ile Leu Ile Asp Lys Phe
40 45 50

ggc cct cgg aag ctc ctt gcc att ggt gct ttg gtg atg ggt atc ggc 307
Gly Pro Arg Lys Leu Leu Ala Ile Gly Ala Leu Val Met Gly Ile Gly
55 60 65

cag ctc att ttg ggc ttt acg gat agc tat tcc atc gcg att att gcc 355
Gln Leu Ile Leu Gly Phe Thr Asp Ser Tyr Ser Ile Ala Ile Ile Ala
70 75 80 85

cgc gtg ttt atc ggc gcc ggc gat gca tcg atc ttc ctt tcg gtt atg 403
Arg Val Phe Ile Gly Ala Gly Asp Ala Ser Ile Phe Leu Ser Val Met
90 95 100

cgc atc ctg ccg ttt tgg ttc cca ctg aag cac acc cct att ttc acg 451
Arg Ile Leu Pro Phe Trp Phe Pro Leu Lys His Thr Pro Ile Phe Thr
105 110 115

cag tta act acc tgc ctt ggc cag ttg ggc cag ttc ttt tct gcg gtg 499
Gln Leu Thr Thr Cys Leu Gly Gln Leu Gly Gln Phe Phe Ser Ala Val
120 125 130

cct ttc atg gcg ttg ttg ggt gcg cag ggt tgg cct gtg gcg ttt gtc 547
Pro Phe Met Ala Leu Leu Gly Ala Gln Gly Trp Pro Val Ala Phe Val

09602740 "062300"

135	140	145	
agc ctt ggt tcc gtg gtg gca ctc att gcg atc gca gcg ctg gtg gcc Ser Leu Gly Ser Val Val Ala Leu Ile Ala Ile Ala Ala Leu Val Ala 150 155 160 165			595
gtt cgg gat act cca gat cct cag cca aaa cct gtc gaa tca gct cag Val Arg Asp Thr Pro Asp Pro Gln Pro Lys Pro Val Glu Ser Ala Gln 170 175 180			643
gaa gca gat aaa cca agc ctg cgc gcg agt ttg aag ttg att gtc cgc Glu Ala Asp Lys Pro Ser Leu Arg Ala Ser Leu Lys Leu Ile Val Arg 185 190 195			691
aat ccg att acg tgg cag ggt ttc ttc att cac tac gta ttg atg gtg Asn Pro Ile Thr Trp Gln Gly Phe Phe Ile His Tyr Val Leu Met Val 200 205 210			739
tgg cag acc gtg ttc tcc atg atg tgg ggc gtc ccg ctg atg act ttg Trp Gln Thr Val Phe Ser Met Met Trp Gly Val Pro Leu Met Thr Leu 215 220 225			787
ggc atg gga ctg tct gca acg acg gct ggt ttg gtg ttg agc atc aac Gly Met Gly Leu Ser Ala Thr Thr Ala Gly Leu Val Leu Ser Ile Asn 230 235 240 245			835
acg ctg tgc atg gtg gta tgc gcg cca atc atc gga ata att tcc gca Thr Leu Cys Met Val Val Ser Ala Pro Ile Ile Gly Ile Ile Ser Ala 250 255 260			883
cgc ctt ggg tat cgc cgt gac gtg gtc gcc att gcg ctg tgc ttt gtt Arg Leu Gly Tyr Arg Arg Asp Val Val Ala Ile Ala Leu Ser Phe Val 265 270 275			931
caa tcc gca gta tgg ctg gtg ttc ttg gcc tcc gat gca cct cgt ggt Gln Ser Ala Val Trp Leu Val Phe Leu Ala Ser Asp Ala Pro Arg Gly 280 285 290			979
ttg atg gct atc atc ttg gtc aac atc gtc atg ggt ctg act act gcg Leu Met Ala Ile Ile Leu Val Asn Ile Val Met Gly Leu Thr Thr Ala 295 300 305			1027
gct tct ggt tat ggc ttt gac acc att cgt gag cgc cta gat cgc aag Ala Ser Gly Tyr Gly Phe Asp Thr Ile Arg Glu Arg Leu Asp Arg Lys 310 315 320 325			1075
att ttg gct gcg ggc acg gga ctg gca aac atg ggt gga ttc ttg tca Ile Leu Ala Ala Gly Thr Gly Leu Ala Asn Met Gly Gly Phe Leu Ser 330 335 340			1123
tgc atg gtt gca gcg cag gtt atg ggg ttc ctt ctt gat cac agc gcg Ser Met Val Ala Ala Gln Val Met Gly Phe Leu Leu Asp His Ser Ala 345 350 355			1171
cat ggt agc acc tat act tgg gtg gac ttc cgt ttt ggt ttc ctt gcg His Gly Ser Thr Tyr Thr Trp Val Asp Phe Arg Phe Gly Phe Leu Ala 360 365 370			1219
att ctt gtc aca tgg gcc gtc gga gtc acg gga ttt gtt gta gcc cga Ile Leu Val Thr Trp Ala Val Gly Val Thr Gly Phe Val Val Ala Arg 375 380 385			1267

09602740-062300

ctc aag ggt gga ccg ggc cgc aga tta ctc gcc cag att agg tct acc 1315
 Leu Lys Gly Gly Pro Gly Arg Arg Leu Leu Ala Gln Ile Arg Ser Thr
 390 395 400 405

aag gac ttt taaagatcgg gtaaaacctg tgg 1347
 Lys Asp Phe

<210> 462

<211> 408

<212> PRT

<213> *Corynebacterium glutamicum*

<400> 462

Met Ala Ala Ile Thr Ser Arg Thr Ser Phe Gly Val Ala Gly Val Glu
 1 5 10 15

Ala Ile Asp Arg Phe Gln Val Asp Ala Thr Arg Ile Ala Val Phe Thr
 20 25 30

Ser Val Gln Val Gly Val Tyr Ala Phe Ala Gln Ile Pro Met Gly Ile
 35 40 45

Leu Ile Asp Lys Phe Gly Pro Arg Lys Leu Leu Ala Ile Gly Ala Leu
 50 55 60

Val Met Gly Ile Gly Gln Leu Ile Leu Gly Phe Thr Asp Ser Tyr Ser
 65 70 75 80

Ile Ala Ile Ile Ala Arg Val Phe Ile Gly Ala Gly Asp Ala Ser Ile
 85 90 95

Phe Leu Ser Val Met Arg Ile Leu Pro Phe Trp Phe Pro Leu Lys His
 100 105 110

Thr Pro Ile Phe Thr Gln Leu Thr Thr Cys Leu Gly Gln Leu Gly Gln
 115 120 125

Phe Phe Ser Ala Val Pro Phe Met Ala Leu Leu Gly Ala Gln Gly Trp
 130 135 140

Pro Val Ala Phe Val Ser Leu Gly Ser Val Val Ala Leu Ile Ala Ile
 145 150 155 160

Ala Ala Leu Val Ala Val Arg Asp Thr Pro Asp Pro Gln Pro Lys Pro
 165 170 175

Val Glu Ser Ala Gln Glu Ala Asp Lys Pro Ser Leu Arg Ala Ser Leu
 180 185 190

Lys Leu Ile Val Arg Asn Pro Ile Thr Trp Gln Gly Phe Phe Ile His
 195 200 205

Tyr Val Leu Met Val Trp Gln Thr Val Phe Ser Met Met Trp Gly Val
 210 215 220

Pro Leu Met Thr Leu Gly Met Gly Leu Ser Ala Thr Thr Ala Gly Leu
 225 230 235 240

09602740-062300

Val Leu Ser Ile Asn Thr Leu Cys Met Val Val Ser Ala Pro Ile Ile
 245 250 255

Gly Ile Ile Ser Ala Arg Leu Gly Tyr Arg Arg Asp Val Val Ala Ile
 260 265 270

Ala Leu Ser Phe Val Gln Ser Ala Val Trp Leu Val Phe Leu Ala Ser
 275 280 285

Asp Ala Pro Arg Gly Leu Met Ala Ile Ile Leu Val Asn Ile Val Met
 290 295 300

Gly Leu Thr Thr Ala Ala Ser Gly Tyr Gly Phe Asp Thr Ile Arg Glu
 305 310 315 320

Arg Leu Asp Arg Lys Ile Leu Ala Ala Gly Thr Gly Leu Ala Asn Met
 325 330 335

Gly Gly Phe Leu Ser Ser Met Val Ala Ala Gln Val Met Gly Phe Leu
 340 345 350

Leu Asp His Ser Ala His Gly Ser Thr Tyr Thr Trp Val Asp Phe Arg
 355 360 365

Phe Gly Phe Leu Ala Ile Leu Val Thr Trp Ala Val Gly Val Thr Gly
 370 375 380

Phe Val Val Ala Arg Leu Lys Gly Gly Pro Gly Arg Arg Leu Leu Ala
 385 390 395 400

Gln Ile Arg Ser Thr Lys Asp Phe
 405

<210> 463
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 <212> DNA
 <213> Corynebacterium glutamicum

<220>
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 <222> (101)..(2242)
 <223> RXN01554

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tagacgtata aacaagtttg aaaaaggaag gttatccatc ttg aaa aag cat gtg 115
 Leu Lys Lys His Val
 1 5

acc tca gcc gtt acc gcc gtg gtg acg gct ttt tca acg gct gcg ctt 163
 Thr Ser Ala Val Thr Ala Val Val Thr Ala Phe Ser Thr Ala Ala Leu
 10 15 20

ggt tta agt att gcc gtt tct cct gct gtt gcc caa gtg gct aat cca 211
 Gly Leu Ser Ile Ala Val Ser Pro Ala Val Ala Gln Val Ala Asn Pro
 25 30 35

gct cca gat ctt tct gcg ccg tat aca tgg gtg gaa gag ttt gat tcc 259
 Ala Pro Asp Leu Ser Ala Pro Tyr Thr Trp Val Glu Glu Phe Asp Ser

09602740-063300

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Overall Statistics		Demographics		Performance		Attendance		Retention	
Category	Value	Category	Value	Category	Value	Category	Value	Category	Value
Total Participants	120	Age Group	18-25	Score Range	70-95	Days Present	15-20	Dropouts	5-10
Gender Distribution	60% Male, 40% Female	Education Level	High School	Average Score	82	Absent Days	2-5	Completion Rate	90%
Ethnicity Breakdown	45% White, 35% Black, 20% Hispanic	Employment Status	Unemployed	Standard Deviation	10	Attendance Rate	85%	Re-enrollment	15%
Income Level	\$10,000-\$20,000	Program Duration	12 Weeks	Top Performers	90-95	Program Feedback	4.5/5	Long-term Impact	25%
Geographic Location	Urban	Program Type	Online	Bottom Performers	70-75	Program Cost	\$500	Program Success	80%
Program Start Date	2023-01-01	Program End Date	2023-03-31	Program Duration (Days)	90	Program Budget	\$10,000	Program Evaluation	Positive
Program Manager	John Doe	Program Coordinator	Jane Smith	Program Facilitator	Mike Johnson	Program Analyst	Sarah Lee	Program Reviewer	David Kim
Program Sponsor	ABC Foundation	Program Partner	XYZ Company	Program Stakeholder	DEF Agency	Program Consultant	GHI Institute	Program Advisor	JKL University
Program Contact	123-456-7890	Program Website	www.abc.org	Program Email	info@abc.org	Program Phone	123-456-7890	Program Fax	123-456-7890
Program Address	123 Main St, New York, NY 10001	Program Zip Code	10001	Program City	New York	Program State	NY	Program Country	USA
Program Description	A 12-week online program for at-risk youth, focusing on life skills, career training, and mental health support.	Program Objectives	Improve employment rates, increase financial literacy, and enhance social skills.	Program Outcomes	85% completion rate, 75% employment rate, 90% satisfaction.	Program Impact	Positive impact on participants' lives, leading to improved outcomes.	Program Evaluation	Positive

Ser Thr Ala Ala Leu Gly Leu Ser Ile Ala Val Ser Pro Ala Val Ala
20 25 30

Gln Val Ala Asn Pro Ala Pro Asp Leu Ser Ala Pro Tyr Thr Trp Val
 35 40 45
 Glu Glu Phe Asp Ser Glu Asp Ala Leu Lys Gly Trp Asn Ile Phe Arg
 50 55 60
 Gln Pro Asp Tyr Gly Ser Asp Lys Val Leu Tyr Thr Glu Asp Ala Leu
 65 70 75 80
 Ser Ile Glu Asp Gly Lys Leu Thr Ile Thr Thr Gln Arg His Cys Val
 85 90 95
 Asp Glu Asp Phe Ala Ile Ser Asp Pro Val Asn Arg Gly Lys Leu Asn
 100 105 110
 Asp Ser Thr Ala Gln Val Glu Pro Cys Ala Pro Gly Gln Phe Glu Lys
 115 120 125
 Phe Thr Ser Ala Arg Ile Val Thr Pro Lys Ile Ala Arg Gly Glu Phe
 130 135 140
 Asp Leu Ser Val Thr Ala Thr Leu Asn Thr Gly Gly Val Glu Gly Val
 145 150 155 160
 Arg Ser Ala Ile Trp Met Gln Asn Gly Glu Gln Ala Cys Ser Ser Ala
 165 170 175
 Thr Asn Asn Gly Leu Tyr Gly Glu Leu Asp Leu Val Glu His Phe Ser
 180 185 190
 Tyr Asp Leu Arg Ser Pro Trp Ser Pro Ser Asn Thr His Leu Gly Cys
 195 200 205
 Asp Pro Glu Ser Val Asn Gly Thr Asn Arg Ala Pro Arg Glu Leu Lys
 210 215 220
 Leu Asp Glu Ser Leu Asp Gly Val Glu His Thr Trp Thr Val Ser Thr
 225 230 235 240
 Thr Arg Asp Gly Val Glu Tyr Phe Ile Asp Asp Glu Ala Ile Asn Arg
 245 250 255
 Gln Ser Trp Arg Asn Asp Val Thr Leu Gly His Ala Glu Ile Asp Asp
 260 265 270
 Phe Gly Ile Ser Ala Gln Thr Phe Asp Glu Ile Val Asp Arg Glu Trp
 275 280 285
 Thr Leu Thr Leu Asn Gln Lys Val Glu Ser Ala Asp Trp Ala Lys Pro
 290 295 300
 Arg Ser Ser Glu Glu Asp Phe Pro Val Arg Ser Met Val Ile Asp Arg
 305 310 315 320
 Ile Glu Val Thr Gly Ser Pro Ala Val Ser Glu Asp Thr Pro Met Pro
 325 330 335
 Asp Thr Thr Gln Leu Leu Thr Gln Asp Thr Leu Glu Tyr Leu Gly Arg
 340 345 350
 Met Pro Val Leu Glu Arg Tyr Glu Pro Ala Ser Ala Asp Phe Ala Asp

006290" 04220960

090240-06300

Ser Ser Leu Val Phe Thr Leu Ala Leu Asn Gln Glu Ala Leu Gln Asn
690 695 700

Leu Ile Asn Gln Phe Met Arg Gln Phe Lys
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<210> 465
<211> 389
<212> DNA
<213> Corynebacterium glutamicum
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<222> (101)..(382)  
<223> RXN03015
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						Leu	Gly	Val	Gly	Thr	5					
						1										
cct	cag	cag	aag	ggt	act	tat	gcg	gcg	gat	ctg	acg	tat	gtt	cgt	cag	163
Pro	Gln	Gln	Lys	Gly	Thr	Tyr	Ala	Ala	Asp	Leu	Thr	Tyr	Val	Arg	Gln	
				10					15					20		
gtt	gtt	gag	gat	ttg	gtg	ccg	ctg	ctt	gag	ggc	gag	cac	att	att	ttc	211
Val	Val	Glu	Asp	Leu	Val	Pro	Leu	Leu	Glu	Gly	Glu	His	Ile	Ile	Phe	
				25					30					35		
ggc	aag	tct	acg	gtt	ccg	gtt	ggt	act	gct	gag	cag	ttg	cag	gag	ctt	259
Gly	Lys	Ser	Thr	Val	Pro	Val	Gly	Thr	Ala	Glu	Gln	Leu	Gln	Glu	Leu	
				40					45					50		
gct	gat	tct	ctg	gtc	aag	cct	ggt	tcg	cac	gtg	gag	atc	gcg	tgg	aat	307
Ala	Asp	Ser	Leu	Val	Lys	Pro	Gly	Ser	His	Val	Glu	Ile	Ala	Trp	Asn	
				55					60					65		
ccg	gag	ttc	ttg	cgt	gag	ggc	tac	gcg	gtc	aaa	gac	acc	atc	act	ccg	355
Pro	Glu	Phe	Leu	Arg	Glu	Gly	Tyr	Ala	Val	Lys	Asp	Thr	Ile	Thr	Pro	
				70					75					80		
gac	cgc	atc	gtg	gtg	ggt	gtg	cgt	gaa	taagaca							389
Asp	Arg	Ile	Val	Val	Gly	Val	Arg	Glu								
				90												

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<210> 466
<211> 94
<212> PRT
<213> Corynebacterium glutamicum
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<400> 466
Leu Gly Val Gly Thr Pro Gln Gln Lys Gly Thr Tyr Ala Ala Asp Leu
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Thr Tyr Val Arg Gln Val Val Glu Asp Leu Val Pro Leu Leu Glu Gly
          20          25          30

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[illegible]

120 125 130

ccg atc gtt aag gac tac gtc gac tac gtc cac atc aag gac gcg acc 547
 Pro Ile Val Lys Asp Tyr Val Asp Tyr Val His Ile Lys Asp Ala Thr
 135 140 145

att cca gat gca gag cac ccc atc gga atc atc aag cca gca gga caa 595
 Ile Pro Asp Ala Glu His Pro Ile Gly Ile Ile Lys Pro Ala Gly Gln
 150 155 160 165

ggc gac ggc caa tac cca gag ctc ctt gcc gcg cta aac gcc gac ggt 643
 Gly Asp Gly Gln Tyr Pro Glu Leu Leu Ala Ala Leu Asn Ala Asp Gly
 170 175 180

tac aac gga ttc gtc tcc atc gag cct cac ctg ggt gac ttc gat gaa 691
 Tyr Asn Gly Phe Val Ser Ile Glu Pro His Leu Gly Asp Phe Asp Glu
 185 190 195

ttc ggc gga ctc tgc gga cct gac ctg tgg acc agc gca tgc gac gct 739
 Phe Gly Gly Leu Cys Gly Pro Asp Leu Trp Thr Ser Ala Cys Asp Ala
 200 205 210

ctc gca gga atc ctg aac aac atc aac gcc gag tac aac taaggacaac 788
 Leu Ala Gly Ile Leu Asn Asn Ile Asn Ala Glu Tyr Asn
 215 220 225

tgataatgac aaa 801

<210> 468
 <211> 226
 <212> PRT
 <213> Corynebacterium glutamicum

<400> 468
 Leu Asp Ala Ala Gly Ile Ser Leu Ser Ala Val Gly Ser Asp Phe Gly
 1 5 10 15
 Lys Ile Asn Ile Thr Asp Pro Phe Glu Asp His Leu Glu Arg Ala Arg
 20 25 30
 His Gly Val Glu Val Ala Lys Leu Phe Gly Ala Lys Tyr Ile Arg Met
 35 40 45
 Phe Ser Phe Phe Ile Ala Glu Gly Asp Asn Pro Glu Ser Phe Arg Lys
 50 55 60
 Glu Val Leu Ser Arg Thr His Ala Met Val Glu Leu Ala Glu Ala Gly
 65 70 75 80
 Gly Ile Thr Leu Leu His Glu Asn Glu Lys Gly Ile Tyr Gly Asp Ser
 85 90 95
 Pro Gln Arg Val Lys Asp Leu Ile Thr Ser Ile Asp Ser Pro Asn Tyr
 100 105 110
 Arg Ala Ile Tyr Asp Ala Ala Asn Tyr Val Gln Thr Gly Phe Lys Pro
 115 120 125
 Phe Asp Glu Ala Trp Pro Ile Val Lys Asp Tyr Val Asp Tyr Val His
 130 135 140

002290"0420960


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<210> 470
<211> 188
<212> PRT
<213> Corynebacterium glutamicum
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Val Leu Pro Leu Asp Pro Ala Ala Ser Leu Lys Ile Tyr Pro Leu Val
1 5 10 15

Thr Gly Arg Thr Lys Ile Asp Glu Val Gln Leu Gln Leu Glu Ala Ala
20 25 30

Ile Arg Ala Glu Leu Pro Gly Val Thr Leu Val Ser Ser Glu Ser Glu
35 40 45

Ala Asp Leu Ala Ile Val Trp Ala Arg Pro Glu Ile Ala Leu Phe Glu
50 55 60

Asp Asp Leu Glu Gly Val Ser Leu Ser Val Asp Pro Arg Ala Asn Gly
65 70 75 80

Val Asp Val Glu Arg Val Gln Ala Val Glu Ala Ala Val Pro Thr Ile
85 90 95

Leu Ala Val Asn Phe Thr Asn Pro Trp Val Leu Ser Glu Ile Glu Pro
100 105 110

Gly Ala Ala Ala Val Val Gly Thr Phe Glu Ile Lys Pro Glu Phe Leu
115 120 125

Leu Lys Ala Leu Thr Gly Gln Glu Gly Gly Pro Lys Gly Lys Leu Pro
130 135 140

Leu Thr Val Pro Ala Ser Met Gln Ala Ile Ala Asp Ser Pro Arg Asp
145 150 155 160

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Met Ala Arg Phe Ser 5															
cca caa gat ctc gca gac cac ctc aag gat gga ctg ctc tct ttc ccg 163															
Pro Gln Asp Leu Ala Asp His Leu Lys Asp Gly Leu Leu Ser Phe Pro 20															
gcc acc gct ttc caa gat gac ctc gaa gta gat gaa gct gct tat gtc 211															
Ala Thr Ala Phe Gln Asp Asp Leu Glu Val Asp Glu Ala Ala Tyr Val 35															
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Arg Val Thr Gln Leu Ala Val Gln Ala Ser Ser Pro Glu Val Pro Val 85															
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Leu Gly Ser Ala Thr Gly Ser Thr Lys Ser Ala Ile Ala Asn Ala Gln 100															
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Gly Ala Glu Ala Ala Gly Ala Glu Gly Val Leu Leu Leu Pro Pro Tyr 115															
ctc acc gaa tgc gac gca gaa ggc ctg tac aac cat gca gcc gca gtc 499															
Leu Thr Glu Cys Asp Ala Glu Gly Leu Tyr Asn His Ala Ala Ala Val 130															
tgt gaa tcc act tct ctt ggt gtc atc gtg tac aac cgt gcc aat gcc 547															
Cys Glu Ser Thr Ser Leu Gly Val Ile Val Tyr Asn Arg Ala Asn Ala 145															
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09502740-062300

09502740 062300


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Ala	Tyr	Gly	Asn	Glu	Arg	Gly	Val	Gly	Glu	Gly	Ile	Arg	Thr	Ala	Gly
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Val	Pro	Arg	Glu	Glu	Leu	Phe	Ile	Ser	Thr	Lys	Leu	Ala	Ala	Glu	Ile
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Lys	Asp	Tyr	Asp	Gly	Ala	Val	Ala	Ala	Ile	Asp	Glu	Ser	Leu	Ala	Lys
65					70					75					80
Ile	Gly	Leu	Asp	Tyr	Val	Asp	Leu	Met	Leu	Ile	His	Ser	Pro	Gln	Pro
				85					90					95	
Trp	Ser	Asp	Phe	Arg	Gly	Gly	Asp	Tyr	Ser	Glu	Gly	Asn	Arg	Glu	Ala
			100					105					110		
Trp	Arg	Ala	Leu	Glu	Asp	Ala	Tyr	Lys	Ala	Gly	Lys	Ile	Arg	Ser	Ile
		115					120					125			
Gly	Val	Ser	Asn	Phe	Leu	Glu	Ala	Asp	Leu	Glu	Asn	Ile	Leu	Asp	Ser
	130					135					140				
Ala	Thr	Val	Ala	Pro	His	Val	Asn	Gln	Leu	Leu	Val	His	Val	Gly	Asn
145					150					155					160
Thr	Pro	Ser	Glu	Leu	Ile	Ser	Phe	Cys	Asp	Ser	Lys	Gly	Ile	Leu	Val
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Glu	Ala	Tyr	Ser	Pro	Ile	Ala	His	Gly	Glu	Met	Leu	Lys	Asn	Gln	Gln
			180					185					190		
Val	Lys	Ala	Ile	Ala	Asp	Lys	Tyr	Asn	Val	Ser	Ile	Pro	Gln	Leu	Cys
		195					200					205			
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Ile Leu Asp Gly Arg Lys Ala His Arg Phe Leu Pro Ala Asn Trp Tyr						
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Lys Leu Lys Pro Leu Asp Gly Val Val Val Ala Ile Leu Val Phe Trp						
	275	280			285	
His Phe Leu Gly Ala Asn Thr Ser Asp Asp Gly Phe Ile Met Thr Met						
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Ala Arg Val Ser Gln Asn Ala Asp Tyr Met Ala Asn Tyr Tyr Arg Trp						
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Phe Gly Val Pro Glu Ser Pro Phe Gly Ala Pro Tyr Tyr Asp Leu Leu						
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Ala Leu Met Ala Tyr Ile Ser Thr Ser Ser Ile Trp Leu Arg Leu Pro						
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Ala Leu Leu Ala Gly Leu Ile Met Trp Phe Val Ile Thr Arg Glu Val						
	355	360			365	
Met Pro Arg Phe Gly Ser Leu Val Asn Gly Arg Arg Val Ala His Trp						
	370	375			380	
Ser Ala Ala Met Val Phe Leu Ala Phe Trp Leu Pro Tyr Asn Asn Gly						
	385	390			395	400
Thr Arg Pro Glu Pro Ile Ile Ala Met Gly Ala Leu Leu Ala Trp Val						
	405	410				415
Ser Phe Glu Arg Ala Ile Ala Thr Ser Arg Leu Leu Pro Ala Ala Ile						
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Gly Val Ile Ile Ala Thr Ile Ser Leu Ala Ser Gly Pro Thr Gly Leu						
	435	440			445	
Met Ala Val Ala Ala Leu Leu Val Ser Leu Ser Ala Leu Ile Arg Ile						
	450	455			460	
Leu Tyr Arg Arg Leu Pro Leu Ile Gly Ala Ser Arg Gly Ala Ser Lys						
	465	470			475	480
Ser Lys Val Phe Gly Ala Ser Met Ala Met Leu Ala Pro Phe Leu Ala						
	485	490				495
Ser Gly Thr Ala Ile Leu Ile Ala Val Phe Gly Asp Gln Thr Leu Ser						
	500	505			510	
Thr Val Met Glu Ser Ile Ser Val Arg Ser Ala Lys Gly Pro Ala Leu						
	515	520			525	
Thr Trp Tyr His Glu Tyr Val Arg Tyr Gln Thr Val Met Glu Gln Thr						
	530	535			540	
Val Asp Gly Ser Phe Thr Arg Arg Phe Ala Val Leu Met Leu Met Ala						
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002290-0420950

Cys Leu Ala Ile Val Val Ile Ala Ile Leu Arg Tyr Gly Arg Ile Pro
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 Gly Ala Ala Lys Gly Pro Ser Leu Arg Leu Met Met Val Ile Phe Gly
 580 585 590
 Thr Met Phe Phe Met Met Phe Thr Pro Thr Lys Trp Thr His His Phe
 595 600 605
 Gly Val Tyr Ala Gly Leu Ala Gly Ala Leu Ala Gly Leu Ala Ala Val
 610 615 620
 Gly Leu Ser Tyr Val Ala Val Lys Ser Pro Arg Met Arg Thr Ile Ser
 625 630 635 640
 Ile Gly Ala Phe Leu Phe Leu Leu Ala Leu Ala Leu Ala Gly Val Asn
 645 650 655
 Gly Phe Trp Tyr Thr Ser Ser Tyr Ala Val Pro Trp Trp Asp Lys Thr
 660 665 670
 Ile Gln Ile Lys Gly Ile Glu Ala Ser Thr Val Val Leu Val Ile Ala
 675 680 685
 Val Ile Val Leu Ile Ile Gly Val Ile Gln Ser Phe Val His Asp Val
 690 695 700
 Lys Thr Ala Gln Ala Glu Thr Asn His Ser Met Gly Glu Leu Val Ala
 705 710 715 720
 Glu Asp Glu Ala Lys Arg Glu Arg Ala Ser Arg Phe Thr Gly Leu Ala
 725 730 735
 Ala Ser Pro Ile Ala Gly Val Ser Ala Leu Val Val Leu Ile Thr Cys
 740 745 750
 Ala Ser Met Gly Lys Gly Phe Val Asp Gln Tyr Pro Ala Tyr Ser Val
 755 760 765
 Gly Leu Gly Asn Leu Arg Ser Leu Thr Gly Asn Thr Cys Gly Leu Ala
 770 775 780
 Ser Asp Ala Met Leu Glu Thr Asn Ser Asn Asp Ser Phe Leu Thr Pro
 785 790 795 800
 Val Asn Ser Thr Leu Gly Glu Ser Leu Glu Ser Glu Asp Ile Arg Gly
 805 810 815
 Phe Ser Ala Ala Gly Ile Pro Pro Ser Ile Ser Gln Asp Gln Ala Asp
 820 825 830
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 835 840 845
 Gly Gly Ser Asp Glu Ser Ser Gly Gln Ser Thr Gly Asn Thr Gly Gly
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Asp Ile Pro Lys Glu Val Leu Pro Asp Leu Pro Pro Leu Pro Glu Gly
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atg cag cag cag ttc gag gac acc att tcc cgt gac gct aag cag caa 211
Met Gln Gln Gln Phe Glu Asp Thr Ile Ser Arg Asp Ala Lys Gln Gln
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cct acg tgg gat cgt gca cag gca gaa aac gtg cgc aag atc ctt gag 259
Pro Thr Trp Asp Arg Ala Gln Ala Glu Asn Val Arg Lys Ile Leu Glu
                40                45                50

tcg gtt cct cca atc gtt gtt gcc cct gag gta ctt gag ctg aag cag 307
Ser Val Pro Pro Ile Val Val Ala Pro Glu Val Leu Glu Leu Lys Gln
                55                60                65

aag ctt gct gat gtt gcc aac ggt aag gcc ttc ctc ttg cag ggt ggt 355
Lys Leu Ala Asp Val Ala Asn Gly Lys Ala Phe Leu Leu Gln Gly Gly
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gac tgt gcg gaa act ttc gag tca aac act gag ccg cac att cgc gcc 403
Asp Cys Ala Glu Thr Phe Glu Ser Asn Thr Glu Pro His Ile Arg Ala
                90                95                100

aac gta aag act ctg ctg cag atg gca gtt gtt ttg acc tac ggt gca 451
Asn Val Lys Thr Leu Leu Gln Met Ala Val Val Leu Thr Tyr Gly Ala
                105                110                115

tcc act cct gtg atc aag atg gct cgt att gct ggt cag tac gca aag 499
Ser Thr Pro Val Ile Lys Met Ala Arg Ile Ala Gly Gln Tyr Ala Lys
                120                125                130

cct cgc tct tct gat ctg gat gga aat ggt ctg cca aac tac cgt ggc 547
Pro Arg Ser Ser Asp Leu Asp Gly Asn Gly Leu Pro Asn Tyr Arg Gly
                135                140                145

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Asp Ile Val Asn Gly Val Glu Ala Thr Pro Glu Ala Arg Arg His Asp
                150                155                160                165

cct gcc cgc atg atc cgt gct tac gct aac gct tct gct gcg atg aac 643
Pro Ala Arg Met Ile Arg Ala Tyr Ala Asn Ala Ser Ala Ala Met Asn
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ttg gtg cgc gcg ctc acc agc tct ggc acc gct gat ctt tac cgt ctc 691
Leu Val Arg Ala Leu Thr Ser Ser Gly Thr Ala Asp Leu Tyr Arg Leu
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agc gag tgg aac cgc gag ttc gtt gcg aac tcc cca gct ggt gca cgc 739
Ser Glu Trp Asn Arg Glu Phe Val Ala Asn Ser Pro Ala Gly Ala Arg
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09602740-06300

[illegible]

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Arg	Lys 50	Ile	Leu	Glu	Ser	Val 55	Pro	Pro	Ile	Val	Val 60	Ala	Pro	Glu	Val
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Leu	Leu	Gln	Gly	Gly 85	Asp	Cys	Ala	Glu	Thr 90	Phe	Glu	Ser	Asn	Thr 95	Glu
Pro	His	Ile 100	Arg	Ala	Asn	Val	Lys	Thr 105	Leu	Leu	Gln	Met	Ala 110	Val	Val
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Gly 130	Gln	Tyr	Ala	Lys	Pro	Arg 135	Ser	Ser	Asp	Leu	Asp 140	Gly	Asn	Gly	Leu
Pro 145	Asn	Tyr	Arg	Gly	Asp 150	Ile	Val	Asn	Gly	Val 155	Glu	Ala	Thr	Pro	Glu 160
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Asp	Leu	Tyr 195	Arg	Leu	Ser	Glu	Trp 200	Asn	Arg	Glu	Phe	Val 205	Ala	Asn	Ser
Pro 210	Ala	Gly	Ala	Arg	Tyr	Glu 215	Ala	Leu	Ala	Arg	Glu 220	Ile	Asp	Ser	Gly
Leu 225	Arg	Phe	Met	Glu	Ala 230	Cys	Gly	Val	Ser	Asp 235	Glu	Ser	Leu	Arg	Ala 240
Ala	Asp	Ile	Tyr	Cys 245	Ser	His	Glu	Ala	Leu 250	Leu	Val	Asp	Tyr	Glu 255	Arg
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Val Thr Tyr Ser Pro
1 5

ggt aaa tac ttg gcg tcg ttc ctg gat tct ttg cct ggt gcg act tca 163
Gly Lys Tyr Leu Ala Ser Phe Leu Asp Ser Leu Pro Gly Ala Thr Ser
10 15 20

cga gac acc cac gtt gtg atg gca gac aat ggt tct gtg gac ggt gtt 211
Arg Asp Thr His Val Val Met Ala Asp Asn Gly Ser Val Asp Gly Val

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Pro	Gly	Ala	Thr 20	Ser	Arg	Asp	Thr	His 25	Val	Val	Met	Ala	Asp 30	Asn	Gly
Ser	Val	Asp 35	Gly	Val	Pro	Glu	Gln 40	Ala	Ala	Ala	Ser	Arg 45	Ser	Asn	Val
Glu	Phe 50	Leu	Ser	Thr	Gly	Gly 55	Asn	Leu	Gly	Tyr	Gly 60	Thr	Ala	Ile	Asn
Ile 65	Ala	Ala	Arg	Ser	Leu 70	Arg	Ala	Arg	Arg	Glu 75	Ala	Gly	Glu	Ile	Asp 80
Gly	Glu	Phe	Phe	Leu 85	Val	Ser	Asn	Pro	Asp 90	Val	Val	Phe	Asp	Glu 95	Asp
Ser	Ile	Asp	Gln 100	Leu	Leu	Glu	Cys	Ala 105	Lys	Arg	His	Pro	Glu 110	Ala	Gly
Ala	Val	Gly 115	Pro	Leu	Ile	Arg	Glu 120	Ala	Asp	Gly	Ser	Ala 125	Tyr	Pro	Ser
Ala	Arg 130	Ala	Val	Pro	Thr	Leu 135	Ala	Asn	Gly	Ile	Gly 140	His	Ala	Leu	Leu
Gly 145	Ala	Val	Trp	Lys	Ser 150	Asn	Pro	Trp	Ser	Ala 155	Ala	Tyr	Arg	Asp	Asp 160
Glu	Asp	Met	Asp	Thr 165	Glu	Arg	Thr	Ala	Gly 170	Trp	Leu	Ser	Gly	Ser 175	Cys
Leu	Leu	Leu	Arg 180	Trp	Asp	Ala	Phe	Asp 185	Arg	Val	Gly	Gly	Phe 190	Asp	Glu
Arg	Tyr 195	Phe	Met	Tyr	Met	Glu	Asp 200	Val	Asp	Leu	Gly	Asp 205	Arg	Leu	Val
Arg	Ala 210	Gly	Phe	Thr	Asn	Val 215	Phe	Cys	Pro	Ser	Ala 220	Gln	Ile	Ile	His
Ala 225	Lys	Gly	His	Val	Ala 230	Gly	Lys	Asn	Pro	Glu 235	Asn	Met	Leu	Pro	Ala 240
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Ile Ala Ser Cys Trp Thr Ser Ala Gly Asp Ala Pro Asp Arg Asp																20
10 15																
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25 30																
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Glu Thr Gly Trp Ala Gly Ile Gly Leu Val His Ala Asp Leu Ile Lys																50
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Ala Arg Asp Thr Ile Gly Tyr Glu Glu Leu Arg Arg Arg Ile His Ala																65
55 60																
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Ala Gly Ile Glu Ile Ile Glu Val Glu Phe Leu Asn Gly Trp Trp Ala																85
70 75 80																
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Thr Gly Ala Glu Arg Gln Glu Ser Asp Ala Val Arg Ala Asp Leu Phe																100
90 95																
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Ala Ala Ala Gln Ala Leu Gly Ser Pro His Ile Lys Val Gly Ala Gly																115
105 110 115																
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Glu Gly Thr Asn Gly Val Val Pro Ile Ala His Met Ala Ser Ala Phe																130
120 125 130																
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Thr Asp Leu Ala Ala Glu Ala Glu Ala His Gly Val Lys Leu Ala Leu																145
135 140 145																

[illegible]

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 gtt gtc agc cat tcc gat agc cca tcg gct gga ctc atg gtt gat atc 643
 Val Val Ser His Ser Asp Ser Pro Ser Ala Gly Leu Met Val Asp Ile
 170 175 180

 tgg cac acc gcg aaa atc gga atc ccc aac gat gaa ctg tgg cgc aac 691
 Trp His Thr Ala Lys Ile Gly Ile Pro Asn Asp Glu Leu Trp Arg Asn
 185 190 195

 att cca ctg tcc aag gtc aac gca gtg gag gtt gat gat ggt ttc att 739
 Ile Pro Leu Ser Lys Val Asn Ala Val Glu Val Asp Asp Gly Phe Ile
 200 205 210

 gac acc cca att gat ctt ttc gat gac tcc acc aac cgt cgc gcg tac 787
 Asp Thr Pro Ile Asp Leu Phe Asp Asp Ser Thr Asn Arg Arg Ala Tyr
 215 220 225

 tgc ggt gaa ggc gaa ttt gat ccc gca agc ttc atc cgt ggc gcc atc 835
 Cys Gly Glu Gly Glu Phe Asp Pro Ala Ser Phe Ile Arg Gly Ala Ile
 230 235 240 245

 gac gcc ggt tgg acg ggc gca tat ggt gtg gaa att att tcc gca gag 883
 Asp Ala Gly Trp Thr Gly Ala Tyr Gly Val Glu Ile Ile Ser Ala Glu
 250 255 260

 cac cga agc ctc ccg gtg aaa gaa ggg ctg caa cgt gct ttc gac acc 931
 His Arg Ser Leu Pro Val Lys Glu Gly Leu Gln Arg Ala Phe Asp Thr
 265 270 275

 acc atc gca gcg ttt gaa caa gct gct cgt ctc gcc ccc tcc act aac 979
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<212> PRT

<213> Corynebacterium glutamicum

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 35 40 45

 Ala Asp Leu Ile Lys Ala Arg Asp Thr Ile Gly Tyr Glu Glu Leu Arg
 50 55 60

 Arg Arg Ile His Ala Ala Gly Ile Glu Ile Ile Glu Val Glu Phe Leu
 65 70 75 80

 Asn Gly Trp Trp Ala Thr Gly Ala Glu Arg Gln Glu Ser Asp Ala Val

00E290"0420960

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Val	Lys	Leu	Ala	Leu	Glu	Ala	Thr	Pro	Phe	Ser	His	Leu	Lys	Thr	Ile	
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Tyr	Asp	Ala	Leu	Glu	Val	Val	Ser	His	Ser	Asp	Ser	Pro	Ser	Ala	Gly	
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aat gcc tcc cgt gct ccg gag gtg gtg gct gcg caa ctc cgt gag att 163
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[illegible]

[illegible]

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Ala	Phe	Val	Asp	Val	Glu	Gly	Gly	Val	Glu	Lys	His	Ser	Leu	Ser	Thr	
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Ala	Asp	Ile	Ala	Ala	Arg	Ala	His	Ala	His	Met	Lys	Ser	His	Asp	Val	
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Arg	Leu	Gly	Gly	Ile	Ala	Trp	Thr	Met	Ile	His	Lys	Gln	Met	Leu	Ser	
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Gly	Val	Gly	Leu	Gly	Glu	Asn	Ser	Ala	Met	Asp	Val	Ala	Leu	Ala	Leu	
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Ala	Leu	Tyr	Arg	Glu	Asn	Ile	Glu	Glu	Ala	Pro	Thr	Lys	Ala	Arg	Ile	
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Gly	Gly 50	Val	Ala	Ala	Arg	Leu 55	Gly	Gly	Ile	Ala	Trp 60	Thr	Met	Ile	His
Lys 65	Gln	Met	Leu	Ser	Arg 70	Asp	Thr	Lys	Gly	Leu 75	Asp	Ile	Thr	Val	Leu 80
Ser	Thr	Ile	Pro	Glu 85	Gly	Val	Gly	Leu	Gly 90	Glu	Asn	Ser	Ala	Met 95	Asp
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Gln	Ala	Pro	His	Pro 165	Val	Ser	Arg	Ser	Ala 170	Gly	Leu	Ser	Ala	Phe 175	Val
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Ala	Arg	His 195	Ala	Phe	Ile	Asp	Glu 200	Ala	Ala	Arg	Ala	Phe 205	Ser	Val	Glu
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Gln	Arg	Thr	Ala 260	Asn	Ala	Leu	Arg	Ser 265	Arg	Arg	Leu	Ser	Glu 270	Phe	Ser
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Thr Ser Asn Lys Arg Val Val Ala Phe His Glu Leu Pro Ser Pro Thr 25 30 35															
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Asp Leu Ile Ala Ala Asn Pro Leu Thr Pro Lys Gln Ala Ser Lys Val 40 45 50															
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Arg Leu Val Val Val Val Gly Pro Cys Ser Val His Asp Pro Glu Ala 70 75 80 85															
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Ala Ile Asp Tyr Ala Asn Arg Leu Ala Pro Leu Ala Lys Arg Leu Asp 90 95 100															
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Gln Asp Leu Lys Ile Val Met Arg Val Tyr Phe Glu Lys Pro Arg Thr 105 110 115															
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Ile Val Gly Trp Lys Gly Leu Ile Asn Asp Pro His Leu Asn Glu Thr 120 125 130															

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[illegible]

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1248

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 35 40 45
 Gln Ala Ser Lys Val Glu Gln Asp Arg Gln Asp Ile Ala Asp Ile Phe
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 Ala Gly Asp Asp Asp Arg Leu Val Val Val Val Gly Pro Cys Ser Val
 65 70 75 80
 His Asp Pro Glu Ala Ala Ile Asp Tyr Ala Asn Arg Leu Ala Pro Leu
 85 90 95
 Ala Lys Arg Leu Asp Gln Asp Leu Lys Ile Val Met Arg Val Tyr Phe
 100 105 110
 Glu Lys Pro Arg Thr Ile Val Gly Trp Lys Gly Leu Ile Asn Asp Pro
 115 120 125
 His Leu Asn Glu Thr Tyr Asp Ile Pro Glu Gly Leu Arg Ile Ala Arg
 130 135 140
 Lys Val Leu Ile Asp Val Val Asn Leu Asp Leu Pro Val Gly Cys Glu
 145 150 155 160
 Phe Leu Glu Pro Asn Ser Pro Gln Tyr Tyr Ala Asp Thr Val Ala Trp
 165 170 175
 Gly Ala Ile Gly Ala Arg Thr Thr Glu Ser Gln Val His Arg Gln Leu
 180 185 190
 Ala Ser Gly Met Ser Met Pro Ile Gly Phe Lys Asn Gly Thr Asp Gly
 195 200 205
 Asn Ile Gln Val Ala Val Asp Ala Val Gln Ala Ala Gln Asn Pro His
 210 215 220
 Phe Phe Phe Gly Thr Ser Asp Asp Gly Ala Leu Ser Val Val Glu Thr
 225 230 235 240
 Ala Gly Asn Ser Asn Ser His Ile Ile Leu Arg Gly Gly Thr Ser Gly
 245 250 255
 Pro Asn His Asp Ala Ala Ser Val Glu Ala Val Val Glu Lys Leu Gly
 260 265 270

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Glu Asn Ala Arg Leu Met Ile Asp Ala Ser His Ala Asn Ser Gly Lys
 275 280 285
 Asp His Ile Arg Gln Val Glu Val Val Arg Glu Ile Ala Glu Gln Ile
 290 295 300
 Ser Gly Gly Ser Glu Ala Val Ala Gly Ile Met Ile Glu Ser Phe Leu
 305 310 315 320
 Val Gly Gly Ala Gln Asn Leu Asp Pro Ala Lys Leu Arg Ile Asn Gly
 325 330 335
 Gly Glu Gly Leu Val Tyr Gly Gln Ser Val Thr Asp Lys Cys Ile Asp
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 <222> (101)..(1108)
 <223> RXS02574

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 Leu Ala Arg Ala Gln
 1 5
 atc cct gaa cag caa cgc gac caa gtc gcg tcg ctg atg atg gtt gga 163
 Ile Pro Glu Gln Gln Arg Asp Gln Val Ala Ser Leu Met Met Val Gly
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 Val Ala Asn Tyr Asp Gln Ala Leu Asp Ala Leu Asn Gln Gly Val Gly
 25 30 35
 ggc atc ttt att ggt tcc tgg aca gat gaa aat ctg ctc acg gaa cct 259
 Gly Ile Phe Ile Gly Ser Trp Thr Asp Glu Asn Leu Leu Thr Glu Pro
 40 45 50
 ggc cgt aat att gag gcg ctc cgc gaa gcc gtc ggc agg gat ttc tcc 307
 Gly Arg Asn Ile Glu Ala Leu Arg Glu Ala Val Gly Arg Asp Phe Ser
 55 60 65
 gtc agc atc gac ttc gaa ggc ggc cgc gtc cag cgt gcc acc aat att 355
 Val Ser Ile Asp Phe Glu Gly Gly Arg Val Gln Arg Ala Thr Asn Ile
 70 75 80 85
 ctt ggt gat ttc ccc tca ccg cgc gtg atg gcg caa acc atg acg ccg 403

09602740-062300

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Glu	Gln	Val	Glu	Asp	Leu	Ala	Glu	Ile	Leu	Gly	Thr	Gly	Leu	Ala	Ala		
			105					110					115				
cat	ggg	gtg	aca	gtt	aac	ttt	gca	cct	gtt	gta	gat	gta	gat	gct	tgg	499	
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 Arg Ala Ala Thr Asn Gly Thr Ile Ala Arg Ile Gly Leu Thr Tyr Arg
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 Phe Val Ala Gly Ser Asp Phe Ala Ala Val Arg Gly Gly Gln Leu Ser
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Leu Gly Pro Val Phe Glu Ser Val Ser His Gly Tyr Asp Thr Leu Asp
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Phe Tyr Arg Ile Asp Pro Arg Leu Gly Thr Glu Glu Asp Met Asp Ala
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Val Phe Asn His Val Ser Ser Ser Ser Lys Tyr Leu Asp Leu Thr Thr
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Gly Ala Ser Phe Glu Gly His Asp Ile Leu Ala Glu Leu Asp His Thr
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 Gly Ala Ser Phe Glu Gly His Asp Ile Leu Ala Glu Leu Asp His Thr
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 aat ccc gcc gta gtg gat ctg gtt gtc gat gtc atg aac cac tgg ctc 547
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 Asp Arg Val Lys Cys Leu His Val Leu Ile Asp Tyr Ala Leu Ala Glu
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 ggc cca cac cat ttc ctt 517
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 Phe Pro Thr Leu Tyr Tyr Leu Thr Asp Pro Arg Leu Thr Thr Glu Ala
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 Phe Leu Ala Lys Arg Asn Ala Ile Glu Asp Leu Gly Thr Asp Phe Ser
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Thr Arg His Gly Thr Tyr Asn Gly Lys Met Phe Gly Gly Ser Ser Leu
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Ser	Ala 195	Ala	Asn	Leu	Leu	Cys	Ser 200	Asn	Asp	Arg	Asp	Leu 205	Ser	Thr	Pro
Glu	Gly 210	Trp	Thr	Ala	Ala	Val 215	His	Ser	Tyr	Asn	Met 220	Ser	Asn	Gln	Tyr
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Education	0.0000	0.0000	0.0000	0.0000
Income	0.0000	0.0000	0.0000	0.0000
Health	0.0000	0.0000	0.0000	0.0000
Religion	0.0000	0.0000	0.0000	0.0000
Occupation	0.0000	0.0000	0.0000	0.0000
City	0.0000	0.0000	0.0000	0.0000
State	0.0000	0.0000	0.0000	0.0000
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Yarrow	0.0000	0.0000	0.0000	0.0000
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Marigold	0.0000	0.0000	0.0000	0.0000
Geranium	0.0000	0.0000	0.0000	0.0000
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Phe  Val  Gln  Gln  Val  Ala  Asn  Asn  Leu  Pro  Val  Thr  Glu  Trp  Gly  Val
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Leu  Arg  Glu  Gly  Gly  Pro  Ala  Val  Ile  Asp  Thr  Ala  His  Trp  Ala  Ser
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 Ala Thr Arg Leu Leu Gly Gly Met Asp Lys Trp Gly Val His Val Leu
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 Gly Ala Ile Gly Asp Tyr Arg Glu Cys Ala Phe Glu Ile Glu Gly Thr
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 Arg Asn Leu Arg Ala Arg Leu Thr Ser Val Leu Arg Glu Ala His Pro
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 290 295 300
 Ile Lys Leu Gly Val Asp Val Tyr Val Thr Ser Asp Leu Arg His His
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Figure 1 consists of 12 bar charts, labeled (a) through (l), each representing a different parameter. Each chart compares the distribution of that parameter for two consecutive seasons: 1997-1998 (represented by black bars) and 1998-1999 (represented by white bars). The x-axis for each chart represents the percentage of the population, and the y-axis represents the number of individuals. The distributions are generally similar between the two seasons, with some variations in the proportions of different categories.

- (a) Age: The distribution is skewed towards younger ages, with a peak in the 18-24 age group.
- (b) Sex: The distribution is relatively even between males and females.
- (c) Education: The distribution is skewed towards higher education levels, with a peak in the 12-15 years group.
- (d) Income: The distribution is skewed towards lower income levels, with a peak in the 0-10,000 range.
- (e) Employment: The distribution is skewed towards full-time employment, with a peak in the 35-44 age group.
- (f) Health: The distribution is skewed towards better health, with a peak in the 'Good' category.
- (g) Insurance: The distribution is skewed towards having insurance, with a peak in the 'Yes' category.
- (h) Housing: The distribution is skewed towards owning a home, with a peak in the 'Own' category.
- (i) Transportation: The distribution is skewed towards having a car, with a peak in the 'Yes' category.
- (j) Food: The distribution is skewed towards eating more meals, with a peak in the '3-4' range.
- (k) Recreation: The distribution is skewed towards more recreational activities, with a peak in the '3-4' range.
- (l) Other: The distribution is skewed towards more other activities, with a peak in the '3-4' range.

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 Ala Glu Pro His Ser Trp Asp Leu Cys Glu His His Ala Glu Arg Ile
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 Thr Ala Pro Leu Gly Trp Glu Met Leu Arg Val Asn Asp Ile Lys Val
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Asn Pro Gly Arg Lys Leu Arg Ala Tyr Val Asp His Ala Arg Ile Val
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His Thr Gly Arg Thr Asp Val Gly Leu Ala Ile Ala Asn Val Ile Ala
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Pro Ile Trp Thr Arg Arg Gly Leu Val Ser Ala Val Leu Asp Phe Pro
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Glu Leu Met Glu Ser Leu Pro Glu Leu Arg Gly Pro Glu Pro Ile Thr
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 Val Ser Gly Met Ala Glu Gly Tyr Glu Thr His Leu Val Asp Leu Ala
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 Gly Val Pro Val Met Ala Met Arg Arg Gly Ile Thr Ser Asp Val Val
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Thr Thr Thr Val Val Asp His Trp Ser Asp Ala Asp Lys Ala Glu Asp	200	205	210	
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Val Ala Ile Arg Leu Pro Asp Asp Ser Pro Thr Asn Arg Glu Thr Lys	265	270	275	
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Thr Asp Ala Arg Leu Pro Gln Asn Phe Gly Leu Ser Ser Ser Ser Leu	310	315	320	325

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 Leu Ala Asn Phe Asp Asp Ala Asn Leu Arg Arg Ser Ala Arg Ala Ala
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 Val Ala Ala Ala Ala Arg Val Glu Arg Ala Met Lys Ile Leu Gly Asp
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 Thr Lys Asp Ala Val Ala Gly Arg Ile Arg Arg Leu Leu Thr Met Ala
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 Asp Asp Gly Gly Phe Gly Pro Leu Arg Ala Ile Gly Gly Met Phe Leu 35
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 His Ile Gly Pro Gly His Met Leu Leu Asn Leu Val Leu Leu Trp Leu 50
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 Met Ala Ile Leu Val Gly Leu Phe Val Leu Arg Ser Ala Asp Ile Arg
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 Ala Pro Leu Ile Leu Ile Ala Ile Asn Ile Ala Tyr Thr Leu Met Ser
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 Leu Ile Thr Trp Pro Met Val Lys Ala Lys Thr Gln Arg Thr Arg Trp
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 att atc gtg ctc att ggt ttt gct gta gtt gtg gct gct gtc att cta 643
 Ile Ile Val Leu Ile Gly Phe Ala Val Val Val Ala Ala Val Ile Leu
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 Gly Gly Met Phe Leu His Ile Gly Pro Gly His Met Leu Leu Asn Leu
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 Val Leu Leu Trp Leu Leu Gly Arg Glu Ile Glu Arg Asp Phe Gly Ser
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Tyr Thr Leu Met Ser Thr Asn Val Ser Leu Trp Gly His Leu Gly Gly
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Leu Ile Thr Gly Ala Leu Ile Thr Trp Pro Met Val Lys Ala Lys Thr
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 Asp Asp Gly Gly Phe Gly Pro Leu Arg Ala Ile Gly Gly Met Phe Leu
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 His Ile Gly Pro Gly His Met Leu Leu Asn Leu Val Leu Leu Trp Leu
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acc aat gtt tct ctg tgg gga cac ctt gga ggt ttg atc act gga gct 547
 Thr Asn Val Ser Leu Trp Gly His Leu Gly Gly Leu Ile Thr Gly Ala
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 Ile Ile Val Leu Ile Gly Phe Ala Val Val Ala Ala Val Ile Leu
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Gly Gly Met Phe Leu His Ile Gly Pro Gly His Met Leu Leu Asn Leu
 35 40 45

Val Leu Leu Trp Leu Leu Gly Arg Glu Ile Glu Arg Asp Phe Gly Ser
 50 55 60

Ala Leu Phe Thr Ala Met Tyr Phe Val Gly Gly Ile Gly Ala Ser Ala
 65 70 75 80

Ala Val Ile Trp Met Asp Pro Tyr Ser Pro Thr Ala Gly Ala Ser Gly
 85 90 95

Ala Ile Tyr Ala Met Met Ala Ile Leu Val Gly Leu Phe Val Leu Arg
 100 105 110

Ser Ala Asp Ile Arg Ala Pro Leu Ile Leu Ile Ala Ile Asn Ile Ala
 115 120 125

Tyr Thr Leu Met Ser Thr Asn Val Ser Leu Trp Gly His Leu Gly Gly
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Leu Ile Thr Gly Ala Leu Ile Thr Trp Pro Met Val Lys Ala Lys Thr
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 Val Ala Thr Asp Asn
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aac aag gct gtc ctg cac tac ccc ggt ggc gag ttc gaa atg gac atc 163
 Asn Lys Ala Val Leu His Tyr Pro Gly Gly Glu Phe Glu Met Asp Ile
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 Ile Glu Ala Ser Glu Gly Asn Asn Gly Val Val Leu Gly Lys Met Leu
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 Ser Glu Thr Gly Leu Ile Thr Phe Asp Pro Gly Tyr Val Ser Thr Gly
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 Ser Thr Glu Ser Lys Ile Thr Tyr Ile Asp Gly Asp Ala Gly Ile Leu
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cgt tac cgc ggc tat gac atc gct gat ctg gct gag aat gcc acc ttc 355
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 Asn Glu Val Ser Tyr Leu Leu Ile Asn Gly Glu Leu Pro Thr Pro Asp
 90 95 100

gag ctt cac aag ttt aac gac gag att cgc cac cac acc ctt ctg gac 451
 Glu Leu His Lys Phe Asn Asp Glu Ile Arg His His Thr Leu Leu Asp
 105 110 115

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 Asp Gln Leu Asn Pro Leu Asp Glu Ala Gln Leu Asp Lys Ala Thr Val
 150 155 160 165

cgc ctc atg gca aag gtt cca atg ctg gct gcg tac gca cac cgc gca 643
 Arg Leu Met Ala Lys Val Pro Met Leu Ala Ala Tyr Ala His Arg Ala
 170 175 180

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Asp	Asp	Leu	Leu	Asp	Leu	Ala	Ile	Lys	Leu	Glu	Glu	Ile	Ala	Leu	Ala
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Thr	Gly	Leu	Ile	Tyr	Arg	Ala	Met	Gly	Phe	Pro	Thr	Asp	Phe	Phe	Thr
	370					375					380				
Val	Leu	Phe	Ala	Ile	Gly	Arg	Leu	Pro	Gly	Trp	Ile	Ala	His	Tyr	Arg
385					390					395					400
Glu	Gln	Leu	Gly	Ala	Ala	Gly	Asn	Lys	Ile	Asn	Arg	Pro	Arg	Gln	Val
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Tyr	Thr	Gly	Asn	Glu	Ser	Arg	Lys	Leu	Val	Pro	Arg	Glu	Glu	Arg	
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 Cys Gly Pro Ala Ile Leu Phe Ala Pro Ala Gly Arg Ala Glu Ile Ile
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 Pro Lys Ala Ala Ser Lys Ala Asp Met Val Ile Ile Asp Leu Glu Asp
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Arg Asn Ile Arg Glu Ser Gly Leu Asp Pro Lys Arg Thr Ile Val Arg
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Thr Val Gly Pro Ser Asp Pro His Phe Leu Ala Asp Val Glu Met Val
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Lys Ser Thr Asp Phe Thr Leu Val Met Val Pro Lys Leu Leu Gly Ser
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Val Pro Glu Glu Leu Asp Gly Leu Asn Ile Ile Ala Met Ile Glu Thr
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Pro Gln Ala Ala Thr Ser Ile Pro Gln Ile Ala Ala Asp Pro Lys Val
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Val Gly Met Phe Trp Gly Ala Glu Asp Leu Thr His Leu Leu Gly Gly
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Thr His Ser Arg Phe Leu Gly Asp Glu Ser Asn Glu Gly Ser Tyr Arg
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Asp Thr Met Arg Leu Thr Arg Ala Leu Met His Leu His Ala Ala Ala
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Asn Gly Lys Phe Thr Ile Asp Ala Ile His Ala Asp Phe His Asp Glu
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Glu Gly Leu Tyr Leu Glu Ala Val Asp Ala Ala Arg Thr Gly Phe Ala
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Gly Thr Ala Cys Ile His Pro Lys Gln Ile Glu Ile Val Arg Arg Ala
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Tyr Arg Pro Glu Ala Asn Gln Leu Glu Trp Ala Lys Lys Val Val Glu
 225 230 235 240

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Trp Thr Arg Thr Asp Glu Ala Pro Leu Leu Ala Thr Tyr Ser Leu Lys																
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Pro Val Val Glu Ala Phe Ala Ala Thr Ala Gly Ile Glu Val Glu Thr																
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 Glu Ala Asp Tyr Ala Asp Val Phe Lys Gly Asp Lys Gln Trp Gln Glu
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 Ser Val Thr Thr Asp His Ile Ser Pro Ala Ser Ser Ile Lys Pro Gly
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 Thr Pro Ala Ala Gln Tyr Leu Asp Glu His Gly Val Glu Arg His Asp
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 Tyr Asn Ser Leu Gly Ser Arg Arg Gly Asn His Glu Val Met Met Arg
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 435 440 445
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gac atc acc gga ctg acc gca ctt aac gag ggc gag act cct aag act 1584
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 35 40 45

Asn Glu Gly Gly Gly Gln Pro Glu Gly Gly Val Glu Ala Asp Asn Tyr
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Asn Ala Ser Trp Ala Gly Ser Gly Glu Ser Leu Ala Thr Gly Ala Glu
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Gly Arg Pro Ser Lys Pro Val Thr Val Ala Ser Pro Gln Gly Gly Glu
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Tyr Thr Ile Asp His Gly Met Val Ala Ile Ala Ser Ile Thr Ser Cys

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Gly Lys Thr Val Val Pro Leu Leu Leu His Gly Asp Ala Ala Phe Ala	
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Leu	Pro	Glu	Leu	Ile	Pro	Asn	Met	Pro	Lys	Met	Arg	Arg	Val	Ser	Arg	
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 Val Pro Tyr Val Thr Pro Leu Val Arg Lys Leu Ala Glu Lys His Gly
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 Val Asp Leu Asn Thr Val Thr Gly Thr Gly Ile Gly Gly Arg Ile Arg
 210 215 220
 Lys Gln Asp Val Leu Ala Ala Ala Asn Gly Glu Ala Ala Pro Ala Glu
 225 230 235 240
 Ala Ala Ala Pro Val Ser Ala Trp Ser Thr Lys Ser Val Asp Pro Glu
 245 250 255
 Lys Ala Lys Leu Arg Gly Thr Thr Gln Lys Val Asn Arg Ile Arg Glu
 260 265 270
 Ile Thr Ala Met Lys Thr Val Glu Ala Leu Gln Ile Ser Ala Gln Leu
 275 280 285
 Thr Gln Leu His Glu Val Asp Met Thr Arg Val Ala Glu Leu Arg Lys
 290 295 300
 Lys Asn Lys Pro Ala Phe Ile Glu Lys His Gly Val Asn Leu Thr Tyr
 305 310 315 320
 Leu Pro Phe Phe Val Lys Ala Val Val Glu Ala Leu Val Ser His Pro
 325 330 335
 Asn Val Asn Ala Ser Phe Asn Ala Lys Thr Lys Glu Met Thr Tyr His
 340 345 350
 Ser Ser Val Asn Leu Ser Ile Ala Val Asp Thr Pro Ala Gly Leu Leu
 355 360 365
 Thr Pro Val Ile His Asp Ala Gln Asp Leu Ser Ile Pro Glu Ile Ala
 370 375 380
 Lys Ala Ile Val Asp Leu Ala Asp Arg Ser Arg Asn Asn Lys Leu Lys
 385 390 395 400
 Pro Asn Asp Leu Ser Gly Gly Thr Phe Thr Ile Thr Asn Ile Gly Ser
 405 410 415
 Glu Gly Ala Leu Ser Asp Thr Pro Ile Leu Val Pro Pro Gln Ala Gly
 420 425 430
 Ile Leu Gly Thr Gly Ala Ile Val Lys Arg Pro Val Val Ile Thr Glu
 435 440 445
 Asp Gly Ile Asp Ser Ile Ala Ile Arg Gln Met Val Phe Leu Pro Leu
 450 455 460
 Thr Tyr Asp His Gln Val Val Asp Gly Ala Asp Ala Gly Arg Phe Leu
 465 470 475 480
 Thr Thr Ile Lys Asp Arg Leu Glu Thr Ala Asn Phe Glu Gly Asp Leu
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002290" 04220960

Gln Leu

<210> 565

<211> 1005

<212> DNA

<213> Corynebacterium glutamicum

<220>

<221> CDS

<222> (101)..(982)

<223> RXA00782

<400> 565

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 Met Ser Ile Phe Leu
 1 5

aat tca gat tcc cgc atc atc att cag ggc att acc ggt tcg gaa ggt 163
 Asn Ser Asp Ser Arg Ile Ile Ile Gln Gly Ile Thr Gly Ser Glu Gly
 10 15 20

tca gag cat gcg cgt cga att tta gcc tct ggt gcg aag ctc gtg ggt 211
 Ser Glu His Ala Arg Arg Ile Leu Ala Ser Gly Ala Lys Leu Val Gly
 25 30 35

ggc acc aac ccc cgc aaa gct ggg caa acc att ttg atc aat gac act 259
 Gly Thr Asn Pro Arg Lys Ala Gly Gln Thr Ile Leu Ile Asn Asp Thr
 40 45 50

gag ttg cct gta ttt ggc act gtt aag gaa gca atg gag gaa acg ggt 307
 Glu Leu Pro Val Phe Gly Thr Val Lys Glu Ala Met Glu Glu Thr Gly
 55 60 65

gcg gat gtc acc gta att ttc gtt cct cca gcc ttt gcc aaa gct gcg 355
 Ala Asp Val Thr Val Ile Phe Val Pro Pro Ala Phe Ala Lys Ala Ala
 70 75 80 85

atc att gaa gct atc gac gct cac atc cca ctg tgc gtg att att act 403
 Ile Ile Glu Ala Ile Asp Ala His Ile Pro Leu Cys Val Ile Ile Thr
 90 95 100

gag ggc atc cca gtg cgt gac gct tct gag gcg tgg gct tat gcc aag 451
 Glu Gly Ile Pro Val Arg Asp Ala Ser Glu Ala Trp Ala Tyr Ala Lys
 105 110 115

aag gtg gga cac acc cgc atc att ggc cct aac tgc cca ggc att att 499
 Lys Val Gly His Thr Arg Ile Ile Gly Pro Asn Cys Pro Gly Ile Ile
 120 125 130

act ccc ggc gaa tct ctt gcg gga att acg ccg gca aac att gca ggt 547
 Thr Pro Gly Glu Ser Leu Ala Gly Ile Thr Pro Ala Asn Ile Ala Gly
 135 140 145

tcc ggc ccg atc ggg ttg atc tca aag tcg gga aca ctg act tat cag 595
 Ser Gly Pro Ile Gly Leu Ile Ser Lys Ser Gly Thr Leu Thr Tyr Gln
 150 155 160 165

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atg atg tac gaa ctt tca gat att ggc att tct acg gcg att ggt att 643
 Met Met Tyr Glu Leu Ser Asp Ile Gly Ile Ser Thr Ala Ile Gly Ile
 170 175 180

ggc ggt gac cca atc atc ggt aca acc cat atc gac gct ctg gag gcc 691
 Gly Gly Asp Pro Ile Ile Gly Thr Thr His Ile Asp Ala Leu Glu Ala
 185 190 195

ttt gaa gct gat cct gag acc aag gca atc gtc atg atc ggt gag atc 739
 Phe Glu Ala Asp Pro Glu Thr Lys Ala Ile Val Met Ile Gly Glu Ile
 200 205 210

ggt gga gat gca gag gaa cgc gct gct gac ttc att tct aag cac gtg 787
 Gly Gly Asp Ala Glu Glu Arg Ala Ala Asp Phe Ile Ser Lys His Val
 215 220 225

aca aaa cca gtt gtg ggt tac gtg gca ggc ttt acc gcc cct gaa gga 835
 Thr Lys Pro Val Val Gly Tyr Val Ala Gly Phe Thr Ala Pro Glu Gly
 230 235 240 245

aag acc atg ggg cat gct ggc gcc atc gtg aca ggt tca gaa ggc act 883
 Lys Thr Met Gly His Ala Gly Ala Ile Val Thr Gly Ser Glu Gly Thr
 250 255 260

gcg cga gca aag aag cat gca ttg gag gcc gtg ggt gtt cgc gtg gga 931
 Ala Arg Ala Lys Lys His Ala Leu Glu Ala Val Gly Val Arg Val Gly
 265 270 275

aca act ccg agt gaa acc gcg aag ctt atg cgt gag gta gtt gca gct 979
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 Leu

<210> 566

<211> 294

<212> PRT

<213> Corynebacterium glutamicum

<400> 566

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Thr Gly Ser Glu Gly Ser Glu His Ala Arg Arg Ile Leu Ala Ser Gly
 20 25 30

Ala Lys Leu Val Gly Gly Thr Asn Pro Arg Lys Ala Gly Gln Thr Ile
 35 40 45

Leu Ile Asn Asp Thr Glu Leu Pro Val Phe Gly Thr Val Lys Glu Ala
 50 55 60

Met Glu Glu Thr Gly Ala Asp Val Thr Val Ile Phe Val Pro Pro Ala
 65 70 75 80

Phe Ala Lys Ala Ala Ile Ile Glu Ala Ile Asp Ala His Ile Pro Leu
 85 90 95

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Gly Gly Leu Thr Val Val Lys Ala Gln Val Lys Val Gly Gly Arg Gly
 65 70 75 80
 Lys Ala Gly Gly Val Arg Val Ala Pro Thr Ser Ala Gln Ala Phe Asp
 85 90 95
 Ala Ala Asp Ala Ile Leu Gly Met Asp Ile Lys Gly His Thr Val Asn
 100 105 110
 Gln Val Met Val Ala Gln Gly Ala Asp Ile Ala Glu Glu Tyr Tyr Phe
 115 120 125
 Ser Ile Leu Leu Asp Arg Ala Asn Arg Ser Tyr Leu Ala Met Cys Ser
 130 135 140
 Val Glu Gly Gly Met Glu Ile Glu Ile Leu Ala Lys Glu Lys Pro Glu
 145 150 155 160
 Ala Leu Ala Lys Val Glu Val Asp Pro Leu Thr Gly Ile Asp Glu Asp
 165 170 175
 Lys Ala Arg Glu Ile Val Thr Ala Ala Gly Phe Glu Thr Glu Val Ala
 180 185 190
 Glu Lys Val Ile Pro Val Leu Ile Lys Ile Trp Gln Val Tyr Tyr Glu
 195 200 205
 Glu Glu Ala Thr Leu Val Glu Val Asn Pro Leu Val Leu Thr Asp Asp
 210 215 220
 Gly Asp Val Ile Ala Leu Asp Gly Lys Ile Thr Leu Asp Asp Asn Ala
 225 230 235 240
 Asp Phe Arg His Asp Asn Arg Gly Ala Leu Ala Glu Ser Ala Gly Gly
 245 250 255
 Leu Asp Ile Leu Glu Leu Lys Ala Lys Lys Asn Asp Leu Asn Tyr Val
 260 265 270
 Lys Leu Asp Gly Ser Val Gly Ile Ile Gly Asn Gly Ala Gly Leu Val
 275 280 285
 Met Ser Thr Leu Asp Ile Val Ala Ala Ala Gly Glu Arg His Gly Gly
 290 295 300
 Gln Arg Pro Ala Asn Phe Leu Asp Ile Gly Gly Gly Ala Ser Ala Glu
 305 310 315 320
 Ser Met Ala Ala Gly Leu Asp Val Ile Leu Gly Asp Ser Gln Val Arg
 325 330 335
 Ser Val Phe Val Asn Val Phe Gly Gly Ile Thr Ala Cys Asp Val Val
 340 345 350
 Ala Lys Gly Ile Val Gly Ala Leu Asp Val Leu Gly Asp Gln Ala Thr
 355 360 365
 Lys Pro Leu Val Val Arg Leu Asp Gly Asn Asn Val Val Glu Gly Arg
 370 375 380

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Ala Asp Gln Val Ala Tyr Ile Lys Ala Arg Tyr Glu Ala Leu Lys Asp
 130 135 140
 His Pro Leu Phe Gln Gly Met Thr Tyr Ala Asp Asp Glu Ala Thr Phe
 145 150 155 160
 Thr Glu Lys Leu Pro Leu Met Ala Lys Gly Arg Asp Phe Ser Asp Pro
 165 170 175
 Val Ala Ile Ser Trp Ile Asp Glu Gly Thr Asp Ile Asn Tyr Gly Ala
 180 185 190
 Gln Thr Lys Gln Tyr Leu Asp Ala Ala Glu Val Glu Gly Thr Glu Ile
 195 200 205
 Arg Tyr Gly His Glu Val Lys Ser Ile Lys Ala Asp Gly Ala Lys Trp
 210 215 220
 Ile Val Thr Val Lys Asn Val His Thr Gly Asp Thr Lys Thr Ile Lys
 225 230 235 240
 Ala Asn Phe Val Phe Val Gly Ala Gly Gly Tyr Ala Leu Asp Leu Leu
 245 250 255
 Arg Ser Ala Gly Ile Pro Gln Val Lys Gly Phe Ala Gly Phe Pro Val
 260 265 270
 Ser Gly Leu Trp Leu Arg Cys Thr Asn Glu Glu Leu Ile Glu Gln His
 275 280 285
 Ala Ala Lys Val Tyr Gly Lys Ala Ser Val Gly Ala Pro Pro Met Ser
 290 295 300
 Val Pro His Leu Asp Thr Arg Val Ile Glu Gly Glu Lys Gly Leu Leu
 305 310 315 320
 Phe Gly Pro Tyr Gly Gly Trp Thr Pro Lys Phe Leu Lys Glu Gly Ser
 325 330 335
 Tyr Leu Asp Leu Phe Lys Ser Ile Arg Pro Asp Asn Ile Pro Ser Tyr
 340 345 350
 Leu Gly Val Ala Ala Gln Glu Phe Asp Leu Thr Lys Tyr Leu Val Thr
 355 360 365
 Glu Val Leu Lys Asp Gln Asp Lys Arg Met Asp Ala Leu Arg Glu Tyr
 370 375 380
 Met Pro Glu Ala Gln Asn Gly Asp Trp Glu Thr Ile Val Ala Gly Gln
 385 390 395 400
 Arg Val Gln Val Ile Lys Pro Ala Gly Phe Pro Lys Phe Gly Ser Leu
 405 410 415
 Glu Phe Gly Thr Thr Leu Ile Asn Asn Ser Glu Gly Thr Ile Ala Gly
 420 425 430
 Leu Leu Gly Ala Ser Pro Gly Ala Ser Ile Ala Pro Ser Ala Met Ile
 435 440 445

002290" 0420960

Leu Arg Gln Leu Glu Pro Ser Trp Thr Gln Ile Val Phe Glu Arg Leu
 35 40 45
 Asp Gly Pro Ala Gln Glu Ser Ser Ser Pro Trp Asn Asn Ala Gly Thr
 50 55 60
 Gly His Ser Ala Leu Cys Glu Leu Asn Tyr Thr Pro Glu Val Lys Gly
 65 70 75 80
 Lys Val Glu Ile Ala Lys Ala Val Gly Ile Asn Glu Lys Phe Gln Val
 85 90 95
 Ser Arg Gln Phe Trp Ser His Leu Val Glu Glu Gly Val Leu Ser Asp
 100 105 110
 Pro Lys Glu Phe Ile Asn Pro Val Pro His Val Ser Phe Gly Gln Gly
 115 120 125
 Ala Asp Gln Val Ala Tyr Ile Lys Ala Arg Tyr Glu Ala Leu Lys Asp
 130 135 140
 His Pro Leu Phe Gln Gly Met Thr Tyr Ala Asp Asp Glu Ala Thr Phe
 145 150 155 160
 Thr Glu Lys Leu Pro Leu Met Ala Lys Gly Arg Asp Phe Ser Asp Pro
 165 170 175
 Val Ala Ile Ser Trp Ile Asp Glu Gly Thr Asp Ile Asn Tyr Gly Ala
 180 185 190
 Gln Thr Lys Gln Tyr Leu Asp Ala Ala Glu Val Glu Gly Thr Glu Ile
 195 200 205
 Arg Tyr Gly His Glu Val Lys Ser Ile Lys Ala Asp Gly Ala Lys Trp
 210 215 220
 Ile Val Thr Val Lys Asn Val His Thr Gly Asp Thr Lys Thr Ile Lys
 225 230 235 240
 Ala Asn Phe Val Phe Val Gly Ala Gly Gly Tyr Ala Leu Asp Leu Leu
 245 250 255
 Arg Ser Ala Gly Ile Pro Gln Val Lys Gly Phe Ala Gly Phe Pro Val
 260 265 270
 Ser Gly Leu Trp Leu Arg Cys Thr Asn Glu Glu Leu Ile Glu Gln His
 275 280 285
 Ala Ala Lys Val Tyr Gly Lys Ala Ser Val Gly Ala Pro Pro Met Ser
 290 295 300
 Val Pro His Leu Asp Thr Arg Val Ile
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<210> 573

<211> 233

<212> DNA

<213> Corynebacterium glutamicum

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<221> CDS

<222> (1)..(210)

<223> FRXA01695

<400> 573

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atg atc gag ctg ctt gag cgt tgc ttc ggt gac cgc atg atc gag tgg 96
 Met Ile Glu Leu Leu Glu Arg Cys Phe Gly Asp Arg Met Ile Glu Trp
 20 25 30

ggc gac aag ctg aag gac atg atc cct tcc tac ggc aag aag ctt gct 144
 Gly Asp Lys Leu Lys Asp Met Ile Pro Ser Tyr Gly Lys Lys Leu Ala
 35 40 45

tcc gag cca gca ctg ttt gag cag cag tgg gca cgc acc cag aag acc 192
 Ser Glu Pro Ala Leu Phe Glu Gln Gln Trp Ala Arg Thr Gln Lys Thr
 50 55 60

ctg aag ctt gag gaa gcc taaatcttct aactgctttc ttt 233
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 65 70

<210> 574

<211> 70

<212> PRT

<213> Corynebacterium glutamicum

<400> 574

Ala Gly Leu Leu Gly Ala Ser Pro Gly Ala Ser Ile Ala Pro Ser Ala
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Met Ile Glu Leu Leu Glu Arg Cys Phe Gly Asp Arg Met Ile Glu Trp
 20 25 30

Gly Asp Lys Leu Lys Asp Met Ile Pro Ser Tyr Gly Lys Lys Leu Ala
 35 40 45

Ser Glu Pro Ala Leu Phe Glu Gln Gln Trp Ala Arg Thr Gln Lys Thr
 50 55 60

Leu Lys Leu Glu Glu Ala
 65 70

<210> 575

<211> 1063

<212> DNA

<213> Corynebacterium glutamicum

<220>

<221> CDS

<222> (101)..(1063)

<223> RXA00290

<400> 575

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[illegible]

Ile Pro Val Met His Asp Asp Gln His Gly Thr Ala Val Val Ile Leu
 165 170 175
 Ala Ala Leu Arg Asn Ser Leu Lys Leu Leu Asp Arg Lys Ile Glu Asp
 180 185 190
 Leu Lys Ile Val Ile Ser Gly Ala Gly Ala Ala Gly Val Ala Ala Val
 195 200 205
 Asp Met Leu Thr Asn Ala Gly Ala Thr Asp Ile Val Val Leu Asp Ser
 210 215 220
 Arg Gly Ile Ile His Asp Ser Arg Glu Asp Leu Ser Pro Val Lys Ala
 225 230 235 240
 Ala Leu Ala Glu Lys Thr Asn Pro Arg Gly Ile Ser Gly Gly Ile Asn
 245 250 255
 Glu Ala Phe Thr Gly Ala Asp Leu Phe Ile Gly Val Ser Gly Gly Asn
 260 265 270
 Ile Gly Glu Asp Ala Leu Lys Leu Met Ala Pro Glu Pro Ile Leu Phe
 275 280 285
 Thr Leu Ala Asn Pro Thr Pro Glu Ile Asp Pro Glu Leu Ser Gln Lys
 290 295 300
 Tyr Gly Ala Ile Val Ala Thr Gly Pro Val Leu Thr Cys Leu Thr Arg
 305 310 315 320
 Ser

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 <211> 1347
 <212> DNA
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 <223> RXN01048

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 Met Thr Ile Asp Leu
 1 5
 cag cgt tcc acc caa aac ctc acc cat gag gaa atc ttc gag gca cac 163
 Gln Arg Ser Thr Gln Asn Leu Thr His Glu Glu Ile Phe Glu Ala His
 10 15 20
 gag ggc gga aag ctc tcc att agt tcc act cgt ccg ctc cgc gac atg 211
 Glu Gly Gly Lys Leu Ser Ile Ser Ser Thr Arg Pro Leu Arg Asp Met
 25 30 35
 cgc gat ctt tcc ctt gct tac acc cct ggt gtt gct cag gtt tgt gaa 259
 Arg Asp Leu Ser Leu Ala Tyr Thr Pro Gly Val Ala Gln Val Cys Glu

0002290" 07220960

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gca	atc	aag	gaa	gat	cca	gag	gtt	gcg	cgc	acc	cac	acg	ggc	att	gga	307
Ala	Ile	Lys	Glu	Asp	Pro	Glu	Val	Ala	Arg	Thr	His	Thr	Gly	Ile	Gly	
55						60				65						
aac	acc	gtc	gcg	gtt	att	tcc	gac	ggc	acc	gct	gtt	ctt	ggc	ctt	ggc	355
Asn	Thr	Val	Ala	Val	Ile	Ser	Asp	Gly	Thr	Ala	Val	Leu	Gly	Leu	Gly	
70				75				80						85		
gat	atc	gga	cct	cag	gcc	tcc	ctt	ccc	gtc	atg	gag	ggc	aag	gct	cag	403
Asp	Ile	Gly	Pro	Gln	Ala	Ser	Leu	Pro	Val	Met	Glu	Gly	Lys	Ala	Gln	
				90				95						100		
ctg	ttt	agc	tct	ttc	gct	ggc	ctg	aag	gct	atc	cct	atc	gtt	ttg	gac	451
Leu	Phe	Ser	Ser	Phe	Ala	Gly	Leu	Lys	Ala	Ile	Pro	Ile	Val	Leu	Asp	
		105						110				115				
gtt	cac	gat	gtt	gac	gct	ttg	gtt	gag	acc	atc	gca	gcc	atc	gcg	cct	499
Val	His	Asp	Val	Asp	Ala	Leu	Val	Glu	Thr	Ile	Ala	Ala	Ile	Ala	Pro	
120						125						130				
tct	ttc	ggt	gct	atc	aac	ttg	gag	gac	atc	tcc	gct	cct	cgt	tgc	ttc	547
Ser	Phe	Gly	Ala	Ile	Asn	Leu	Glu	Asp	Ile	Ser	Ala	Pro	Arg	Cys	Phe	
135						140				145						
gag	gtg	gag	cgc	cgc	ctc	atc	gag	cgt	ctc	gat	att	cca	gtt	atg	cac	595
Glu	Val	Glu	Arg	Arg	Leu	Ile	Glu	Arg	Leu	Asp	Ile	Pro	Val	Met	His	
150				155				160						165		
gat	gac	cag	cac	ggc	acc	gct	gtg	gtt	atc	ctc	gct	gcg	ctg	cgc	aac	643
Asp	Asp	Gln	His	Gly	Thr	Ala	Val	Val	Ile	Leu	Ala	Ala	Leu	Arg	Asn	
				170				175						180		
tcc	ctg	aag	ctg	ctg	gat	cgc	aag	atc	gaa	gac	ctc	aag	att	gtt	att	691
Ser	Leu	Lys	Leu	Leu	Asp	Arg	Lys	Ile	Glu	Asp	Leu	Lys	Ile	Val	Ile	
		185						190				195				
tcc	ggc	gca	ggc	gca	gcg	ggc	gtt	gca	gct	gta	gat	atg	ctg	acc	aac	739
Ser	Gly	Ala	Gly	Ala	Ala	Gly	Val	Ala	Ala	Val	Asp	Met	Leu	Thr	Asn	
200						205				210						
gct	gga	gca	acc	gac	atc	gtg	gtt	ctt	gat	tcc	cga	ggc	atc	atc	cac	787
Ala	Gly	Ala	Thr	Asp	Ile	Val	Val	Leu	Asp	Ser	Arg	Gly	Ile	Ile	His	
215						220				225						
gac	agc	cgt	gag	gat	ctt	tcc	cca	gtt	aag	gct	gct	ctt	gca	gag	aag	835
Asp	Ser	Arg	Glu	Asp	Leu	Ser	Pro	Val	Lys	Ala	Ala	Leu	Ala	Glu	Lys	
230				235				240						245		
acc	aac	cct	cgt	ggc	atc	agc	ggt	ggc	atc	aat	gag	gct	ttc	acc	ggc	883
Thr	Asn	Pro	Arg	Gly	Ile	Ser	Gly	Gly	Ile	Asn	Glu	Ala	Phe	Thr	Gly	
				250				255				260				
gcg	gac	ctg	ttc	att	ggc	gtg	tcc	ggc	ggc	aac	atc	ggc	gag	gac	gct	931
Ala	Asp	Leu	Phe	Ile	Gly	Val	Ser	Gly	Gly	Asn	Ile	Gly	Glu	Asp	Ala	
		265				270				275						
ctc	aaa	ctc	atg	gcc	ccg	gag	cca	atc	ctg	ttc	acc	ctg	gcg	aac	cca	979
Leu	Lys	Leu	Met	Ala	Pro	Glu	Pro	Ile	Leu	Phe	Thr	Leu	Ala	Asn	Pro	
280						285				290						

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acc cca gag atc gat cct gag ctg tct cag aag tac ggc gcc atc gtc 1027
 Thr Pro Glu Ile Asp Pro Glu Leu Ser Gln Lys Tyr Gly Ala Ile Val
 295 300 305

gcg acc ggg cgc tct gac ctg cct aac cag atc aac aac gtg ctg gcg 1075
 Ala Thr Gly Arg Ser Asp Leu Pro Asn Gln Ile Asn Asn Val Leu Ala
 310 315 320 325

ttc cca gga att ttc gcc ggc gct ctc gca gcc aag gct aag aag atc 1123
 Phe Pro Gly Ile Phe Ala Gly Ala Leu Ala Ala Lys Ala Lys Lys Ile
 330 335 340

acc ccc gag atg aag ctc gcc gct cag agg caa tcg cag aca tcg cag 1171
 Thr Pro Glu Met Lys Leu Ala Ala Gln Arg Gln Ser Gln Thr Ser Gln
 345 350 355

ctg agg acc tcg agg tcg gcc gca tcg tgc cta ccg ccc tgg atc ccc 1219
 Leu Arg Thr Ser Arg Ser Ala Ala Ser Cys Leu Pro Pro Trp Ile Pro
 360 365 370

gcg ttg ccc caa cag tca agg cag ctg tcc agg ccg tcg cca aag cgc 1267
 Ala Leu Pro Gln Gln Ser Arg Gln Leu Ser Arg Pro Ser Pro Lys Arg
 375 380 385

aaa acg ctt aaa aat ttg ctt atc gac gcc tcc ctc ccc gtc gag gcg 1315
 Lys Thr Leu Lys Asn Leu Leu Ile Asp Ala Ser Leu Pro Val Glu Ala
 390 395 400 405

cca ata ttt taagagcaaa cttgaggccc aca 1347
 Pro Ile Phe

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<211> 408

<212> PRT

<213> Corynebacterium glutamicum

<400> 578

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Ile Phe Glu Ala His Glu Gly Gly Lys Leu Ser Ile Ser Ser Thr Arg
 20 25 30

Pro Leu Arg Asp Met Arg Asp Leu Ser Leu Ala Tyr Thr Pro Gly Val
 35 40 45

Ala Gln Val Cys Glu Ala Ile Lys Glu Asp Pro Glu Val Ala Arg Thr
 50 55 60

His Thr Gly Ile Gly Asn Thr Val Ala Val Ile Ser Asp Gly Thr Ala
 65 70 75 80

Val Leu Gly Leu Gly Asp Ile Gly Pro Gln Ala Ser Leu Pro Val Met
 85 90 95

Glu Gly Lys Ala Gln Leu Phe Ser Ser Phe Ala Gly Leu Lys Ala Ile
 100 105 110

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Pro Ile Val Leu Asp Val His Asp Val Asp Ala Leu Val Glu Thr Ile
 115 120 125
 Ala Ala Ile Ala Pro Ser Phe Gly Ala Ile Asn Leu Glu Asp Ile Ser
 130 135 140
 Ala Pro Arg Cys Phe Glu Val Glu Arg Arg Leu Ile Glu Arg Leu Asp
 145 150 155 160
 Ile Pro Val Met His Asp Asp Gln His Gly Thr Ala Val Val Ile Leu
 165 170 175
 Ala Ala Leu Arg Asn Ser Leu Lys Leu Leu Asp Arg Lys Ile Glu Asp
 180 185 190
 Leu Lys Ile Val Ile Ser Gly Ala Gly Ala Ala Gly Val Ala Ala Val
 195 200 205
 Asp Met Leu Thr Asn Ala Gly Ala Thr Asp Ile Val Val Leu Asp Ser
 210 215 220
 Arg Gly Ile Ile His Asp Ser Arg Glu Asp Leu Ser Pro Val Lys Ala
 225 230 235 240
 Ala Leu Ala Glu Lys Thr Asn Pro Arg Gly Ile Ser Gly Gly Ile Asn
 245 250 255
 Glu Ala Phe Thr Gly Ala Asp Leu Phe Ile Gly Val Ser Gly Gly Asn
 260 265 270
 Ile Gly Glu Asp Ala Leu Lys Leu Met Ala Pro Glu Pro Ile Leu Phe
 275 280 285
 Thr Leu Ala Asn Pro Thr Pro Glu Ile Asp Pro Glu Leu Ser Gln Lys
 290 295 300
 Tyr Gly Ala Ile Val Ala Thr Gly Arg Ser Asp Leu Pro Asn Gln Ile
 305 310 315 320
 Asn Asn Val Leu Ala Phe Pro Gly Ile Phe Ala Gly Ala Leu Ala Ala
 325 330 335
 Lys Ala Lys Lys Ile Thr Pro Glu Met Lys Leu Ala Ala Gln Arg Gln
 340 345 350
 Ser Gln Thr Ser Gln Leu Arg Thr Ser Arg Ser Ala Ala Ser Cys Leu
 355 360 365
 Pro Pro Trp Ile Pro Ala Leu Pro Gln Gln Ser Arg Gln Leu Ser Arg
 370 375 380
 Pro Ser Pro Lys Arg Lys Thr Leu Lys Asn Leu Leu Ile Asp Ala Ser
 385 390 395 400
 Leu Pro Val Glu Ala Pro Ile Phe
 405

<210> 579

<211> 311

<212> DNA

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<213> Corynebacterium glutamicum

<220>

<221> CDS

<222> (1) .. (288)

<223> FRXA01048

<400> 579

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Arg Ser Asp Leu Pro Asn Gln Ile Asn Asn Val Leu Ala Phe Pro Gly
1 5 10 15

att ttc gcc ggc gct ctc gca gcc aag gct aag aag atc acc ccc gag 96
Ile Phe Ala Gly Ala Leu Ala Ala Lys Ala Lys Lys Ile Thr Pro Glu
20 25 30

atg aag ctc gcc gct cag agg caa tcg cag aca tcg cag ctg agg acc 144
Met Lys Leu Ala Ala Gln Arg Gln Ser Gln Thr Ser Gln Leu Arg Thr
35 40 45

tcg agg tgc gcc gca tgc tgc cta ccg ccc tgg atc ccc gcg ttg ccc 192
Ser Arg Ser Ala Ala Ser Cys Leu Pro Pro Trp Ile Pro Ala Leu Pro
50 55 60

caa cag tca agg cag ctg tcc agg ccg tcg cca aag cgc aaa acg ctt 240
Gln Gln Ser Arg Gln Leu Ser Arg Pro Ser Pro Lys Arg Lys Thr Leu
65 70 75 80

aaa aat ttg ctt atc gac gcc tcc ctc ccc gtc gag gcg cca ata ttt 288
Lys Asn Leu Leu Ile Asp Ala Ser Leu Pro Val Glu Ala Pro Ile Phe
85 90 95

taagagcaaa cttgaggccc aca 311

<210> 580

<211> 96

<212> PRT

<213> Corynebacterium glutamicum

<400> 580

Arg Ser Asp Leu Pro Asn Gln Ile Asn Asn Val Leu Ala Phe Pro Gly
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Ile Phe Ala Gly Ala Leu Ala Ala Lys Ala Lys Lys Ile Thr Pro Glu
20 25 30

Met Lys Leu Ala Ala Gln Arg Gln Ser Gln Thr Ser Gln Leu Arg Thr
35 40 45

Ser Arg Ser Ala Ala Ser Cys Leu Pro Pro Trp Ile Pro Ala Leu Pro
50 55 60

Gln Gln Ser Arg Gln Leu Ser Arg Pro Ser Pro Lys Arg Lys Thr Leu
65 70 75 80

Lys Asn Leu Leu Ile Asp Ala Ser Leu Pro Val Glu Ala Pro Ile Phe
85 90 95

09624-0690

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<223> FRXA00290
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gagcttcccg caaaaacacc gattaacaag gctaaatgat atg acc atc gac ctg 115																
Met Thr Ile Asp Leu 5																
cag cgt tcc acc caa aac ctc acc cat gag gaa atc ttc gag gca cac 163																
Gln Arg Ser Thr Gln Asn Leu Thr His Glu Glu Ile Phe Glu Ala His 20																
gag ggc gga aag ctc tcc att agt tcc act cgt ccg ctc cgc gac atg 211																
Glu Gly Gly Lys Leu Ser Ile Ser Ser Thr Arg Pro Leu Arg Asp Met 35																
cgc gat ctt tcc ctt gct tac acc cct ggt gtt gct cag gtt tgt gaa 259																
Arg Asp Leu Ser Leu Ala Tyr Thr Pro Gly Val Ala Gln Val Cys Glu 50																
gca atc aag gaa gat cca gag gtt gcg cgc acc cac acg ggc att gga 307																
Ala Ile Lys Glu Asp Pro Glu Val Ala Arg Thr His Thr Gly Ile Gly 65																
aac acc gtc gcg gtt att tcc gac ggc acc gct gtt ctt ggc ctt ggc 355																
Asn Thr Val Ala Val Ile Ser Asp Gly Thr Ala Val Leu Gly Leu Gly 85																
gat atc gga cct cag gcc tcc ctt ccc gtc atg gag ggc aag gct cag 403																
Asp Ile Gly Pro Gln Ala Ser Leu Pro Val Met Glu Gly Lys Ala Gln 100																
ctg ttt agc tct ttc gct ggc ctg aag gct atc cct atc gtt ttg gac 451																
Leu Phe Ser Ser Phe Ala Gly Leu Lys Ala Ile Pro Ile Val Leu Asp 115																
gtt cac gat gtt gac gct ttg gtt gag acc atc gca gcc atc gcg cct 499																
Val His Asp Val Asp Ala Leu Val Glu Thr Ile Ala Ala Ile Ala Pro 130																
tct ttc ggt gct atc aac ttg gag gac atc tcc gct cct cgt tgc ttc 547																
Ser Phe Gly Ala Ile Asn Leu Glu Asp Ile Ser Ala Pro Arg Cys Phe 145																
gag gtg gag cgc cgc ctc atc gag cgt ctc gat att cca gtt atg cac 595																
Glu Val Glu Arg Arg Leu Ile Glu Arg Leu Asp Ile Pro Val Met His 165																
gat gac cagcac ggc acc gct gtg gtt atc ctc gct gcg ctg cgc aac 643																
Asp Asp Gln His Gly Thr Ala Val Val Ile Leu Ala Ala Leu Arg Asn																

170										175					180					
tcc	ctg	aag	ctg	ctg	gat	cgc	aag	atc	gaa	gac	ctc	aag	att	gtt	att	691				
Ser	Leu	Lys	Leu	Leu	Asp	Arg	Lys	Ile	Glu	Asp	Leu	Lys	Ile	Val	Ile					
			185				190						195							
tcc	ggc	gca	ggc	gca	gcg	ggc	gtt	gca	gct	gta	gat	atg	ctg	acc	aac	739				
Ser	Gly	Ala	Gly	Ala	Ala	Gly	Val	Ala	Ala	Val	Asp	Met	Leu	Thr	Asn					
			200				205						210							
gct	gga	gca	acc	gac	atc	gtg	gtt	ctt	gat	tcc	cga	ggc	atc	atc	cac	787				
Ala	Gly	Ala	Thr	Asp	Ile	Val	Val	Leu	Asp	Ser	Arg	Gly	Ile	Ile	His					
			215				220						225							
gac	agc	cgt	gag	gat	ctt	tcc	cca	gtt	aag	gct	gct	ctt	gca	gag	aag	835				
Asp	Ser	Arg	Glu	Asp	Leu	Ser	Pro	Val	Lys	Ala	Ala	Leu	Ala	Glu	Lys					
			230				235						245							
acc	aac	cct	cgt	ggc	atc	agc	ggc	ggc	atc	aat	gag	gct	ttc	acc	ggc	883				
Thr	Asn	Pro	Arg	Gly	Ile	Ser	Gly	Gly	Ile	Asn	Glu	Ala	Phe	Thr	Gly					
			250				255						260							
gcg	gac	ctg	ttc	att	ggc	gtg	tcc	ggc	ggc	aac	atc	ggc	gag	gac	gct	931				
Ala	Asp	Leu	Phe	Ile	Gly	Val	Ser	Gly	Gly	Asn	Ile	Gly	Glu	Asp	Ala					
			265				270						275							
ctc	aaa	ctc	atg	gcc	ccg	gag	cca	atc	ctg	ttc	acc	ctg	gcg	aac	cca	979				
Leu	Lys	Leu	Met	Ala	Pro	Glu	Pro	Ile	Leu	Phe	Thr	Leu	Ala	Asn	Pro					
			280				285						290							
acc	cca	gag	atc	gat	cct	gag	ctg	tct	cag	aag	tac	ggc	gcc	atc	gtc	1027				
Thr	Pro	Glu	Ile	Asp	Pro	Glu	Leu	Ser	Gln	Lys	Tyr	Gly	Ala	Ile	Val					
			295				300						305							
gcg	acc	ggg	ccg	gtc	ttg	acc	tgc	cta	acc	aga	tca					1063				
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<211> 321

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<400> 582

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Ile	Phe	Glu	Ala	His	Glu	Gly	Gly	Lys	Leu	Ser	Ile	Ser	Ser	Thr	Arg
			20					25					30		

Pro	Leu	Arg	Asp	Met	Arg	Asp	Leu	Ser	Leu	Ala	Tyr	Thr	Pro	Gly	Val
		35					40					45			

Ala	Gln	Val	Cys	Glu	Ala	Ile	Lys	Glu	Asp	Pro	Glu	Val	Ala	Arg	Thr
	50					55					60				

His	Thr	Gly	Ile	Gly	Asn	Thr	Val	Ala	Val	Ile	Ser	Asp	Gly	Thr	Ala
65					70					75					80

Val	Leu	Gly	Leu	Gly	Asp	Ile	Gly	Pro	Gln	Ala	Ser	Leu	Pro	Val	Met
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00602740.062300

				85				90				95			
Glu	Gly	Lys	Ala	Gln	Leu	Phe	Ser	Ser	Phe	Ala	Gly	Leu	Lys	Ala	Ile
			100				105						110		
Pro	Ile	Val	Leu	Asp	Val	His	Asp	Val	Asp	Ala	Leu	Val	Glu	Thr	Ile
		115					120					125			
Ala	Ala	Ile	Ala	Pro	Ser	Phe	Gly	Ala	Ile	Asn	Leu	Glu	Asp	Ile	Ser
130					135					140					
Ala	Pro	Arg	Cys	Phe	Glu	Val	Glu	Arg	Arg	Leu	Ile	Glu	Arg	Leu	Asp
145				150					155				160		
Ile	Pro	Val	Met	His	Asp	Asp	Gln	His	Gly	Thr	Ala	Val	Val	Ile	Leu
			165				170						175		
Ala	Ala	Leu	Arg	Asn	Ser	Leu	Lys	Leu	Leu	Asp	Arg	Lys	Ile	Glu	Asp
		180				185					190				
Leu	Lys	Ile	Val	Ile	Ser	Gly	Ala	Gly	Ala	Ala	Gly	Val	Ala	Ala	Val
195					200					205					
Asp	Met	Leu	Thr	Asn	Ala	Gly	Ala	Thr	Asp	Ile	Val	Val	Leu	Asp	Ser
210					215					220					
Arg	Gly	Ile	Ile	His	Asp	Ser	Arg	Glu	Asp	Leu	Ser	Pro	Val	Lys	Ala
225				230					235				240		
Ala	Leu	Ala	Glu	Lys	Thr	Asn	Pro	Arg	Gly	Ile	Ser	Gly	Gly	Ile	Asn
		245				250					255				
Glu	Ala	Phe	Thr	Gly	Ala	Asp	Leu	Phe	Ile	Gly	Val	Ser	Gly	Gly	Asn
			260				265					270			
Ile	Gly	Glu	Asp	Ala	Leu	Lys	Leu	Met	Ala	Pro	Glu	Pro	Ile	Leu	Phe
275					280					285					
Thr	Leu	Ala	Asn	Pro	Thr	Pro	Glu	Ile	Asp	Pro	Glu	Leu	Ser	Gln	Lys
290					295					300					
Tyr	Gly	Ala	Ile	Val	Ala	Thr	Gly	Pro	Val	Leu	Thr	Cys	Leu	Thr	Arg
305				310					315				320		

Ser

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Ile Leu Ala Asp Glu Asp Asp Thr Val Asp Val Gly Ala Val Ile Ala

20				25				30								
Ala	Pro	Ala	Glu	Glu	Glu	Glu	Glu	Pro	Val	Lys	Glu	Glu	Pro	Lys	Lys	Glu
		35					40						45			
Ala	Ala	Pro	Glu	Ala	Pro	Ala	Ala	Thr	Gly	Ala	Ala	Thr	Asp	Val	Glu	
	50					55					60					
Met	Pro	Glu	Leu	Gly	Glu	Ser	Val	Thr	Glu	Gly	Thr	Ile	Thr	Gln	Trp	80
	65				70					75						
Leu	Lys	Ala	Val	Gly	Asp	Thr	Val	Glu	Val	Asp	Glu	Pro	Leu	Leu	Glu	
				85					90					95		
Val	Ser	Thr	Asp	Lys	Val	Asp	Thr	Glu	Ile	Pro	Ser	Pro	Val	Ala	Gly	
			100					105					110			
Thr	Ile	Val	Glu	Ile	Leu	Ala	Asp	Glu	Asp	Asp	Thr	Val	Asp	Val	Gly	
		115					120					125				
Ala	Val	Ile	Ala	Arg	Ile	Gly	Asp	Ala	Asn	Ala	Ala	Ala	Ala	Pro	Ala	
	130					135					140					
Glu	Glu	Glu	Ala	Ala	Pro	Ala	Glu	Glu	Glu	Glu	Pro	Val	Lys	Glu	Glu	160
145					150					155						
Pro	Lys	Lys	Glu	Glu	Pro	Lys	Lys	Glu	Glu	Pro	Lys	Lys	Glu	Ala	Ala	
				165					170					175		
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Val	Pro															

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aaattattaa catccgacgc aacgcttcag gagagtcctc atg aaa gag aca ctg 115
Met Lys Glu Thr Leu
1 5

acc acc ggt tta acc cac caa atg acc tac ata gtg cca gca aac cgc 163
Thr Thr Gly Leu Thr His Gln Met Thr Tyr Ile Val Pro Ala Asn Arg
10 15 20

aca gtt ccg cat ctg ctt ccc gaa gca gca gaa ttt gaa acc atg cca 211
Thr Val Pro His Leu Leu Pro Glu Ala Ala Glu Phe Glu Thr Met Pro
25 30 35

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[illegible]


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Figure 1 consists of 12 bar charts, labeled (a) through (l), each representing a different fish species. The y-axis for all charts is 'Percentage of total catch' ranging from 0 to 100. The x-axis for all charts is 'Year' with values 1990, 1991, 1992, 1993, and 1994. The species and their approximate percentage values are as follows:

- (a) Atlantic croaker: 1990: 10, 1991: 10, 1992: 10, 1993: 10, 1994: 10
- (b) Striped bass: 1990: 10, 1991: 10, 1992: 10, 1993: 10, 1994: 10
- (c) Weakfish: 1990: 10, 1991: 10, 1992: 10, 1993: 10, 1994: 10
- (d) Spot: 1990: 10, 1991: 10, 1992: 10, 1993: 10, 1994: 10
- (e) Blue crab: 1990: 10, 1991: 10, 1992: 10, 1993: 10, 1994: 10
- (f) Rockfish: 1990: 10, 1991: 10, 1992: 10, 1993: 10, 1994: 10
- (g) Bay anchovy: 1990: 10, 1991: 10, 1992: 10, 1993: 10, 1994: 10
- (h) Atlantic silverside: 1990: 10, 1991: 10, 1992: 10, 1993: 10, 1994: 10
- (i) Atlantic herring: 1990: 10, 1991: 10, 1992: 10, 1993: 10, 1994: 10
- (j) Atlantic menhaden: 1990: 10, 1991: 10, 1992: 10, 1993: 10, 1994: 10
- (k) Atlantic bluefish: 1990: 10, 1991: 10, 1992: 10, 1993: 10, 1994: 10
- (l) Atlantic tomcod: 1990: 10, 1991: 10, 1992: 10, 1993: 10, 1994: 10

060709Z
O 063000

gcc	acg	atc	cac	gca	tcc	cag	gat	gat	ttc	cag	gaa	gtc	tcg	aaa	ctt	1411
Ala	Thr	Ile	His	Ala	Ser	Gln	Asp	Asp	Phe	Gln	Glu	Val	Ser	Lys	Leu	
			425					430						435		
atc	ccc	ctc	ttg	gag	gat	ctc	gcg	ggc	cgt	gtt	ctt	tac	ggc	ggc	tgg	1459
Ile	Pro	Leu	Leu	Glu	Asp	Leu	Ala	Gly	Arg	Val	Leu	Tyr	Gly	Gly	Trp	
			440				445					450				
cca	acg	ggt	gtg	gaa	gtt	ggg	cac	acg	gtt	atc	cat	gga	ggc	cct	tat	1507
Pro	Thr	Gly	Val	Glu	Val	Gly	His	Thr	Val	Ile	His	Gly	Gly	Pro	Tyr	
			455			460					465					
ccg	gcg	acc	tca	aat	gcg	cag	tcg	aca	agt	gtt	gga	acc	ctg	gca	atc	1555
Pro	Ala	Thr	Ser	Asn	Ala	Gln	Ser	Thr	Ser	Val	Gly	Thr	Leu	Ala	Ile	
470					475					480					485	
gag	aga	ttt	atg	cg	ccg	gtt	tct	tat	caa	act	ttc	ccg	gct	gag	ctg	1603
Glu	Arg	Phe	Met	Arg	Pro	Val	Ser	Tyr	Gln	Thr	Phe	Pro	Ala	Glu	Leu	
				490					495					500		
ctt	cca	gat	cca	gtt	tct	gag	g	aat	aaa	tgg	gct	gta	cct	cg	gaa	1651
Leu	Pro	Asp	Pro	Val	Ser	Glu	Ala	Asn	Lys	Trp	Ala	Val	Pro	Arg	Glu	
			505					510					515			
ata	gac	cg	taatagctgg	tctttacatt	tg											1683
Ile	Asp	Arg														
			520													
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Trp	Val	Ala	Gly	Lys	Asn	Gly	Glu	Ile	Thr	Gly	Phe	Asp	Pro	Arg	Thr	
			20					25					30			
Asn	Ala	Ser	Leu	Asn	Pro	Ser	Tyr	Ser	Leu	Ala	Asn	Ser	Ala	Gln	Leu	
		35					40					45				
Arg	Ala	Ala	Thr	Thr	Ser	Ala	Lys	Arg	Ala	Phe	Glu	Ser	Tyr	Arg	Leu	
	50					55					60					
Thr	Thr	Pro	Glu	Val	Arg	Ala	Asp	Phe	Leu	Asp	Ser	Ile	Ala	Asp	Asn	
65					70					75					80	
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				85												

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caccgccccat tgcgaatcag cacttaagga agtgactttg atg tca aac gtt gga 115
                                         Met Ser Asn Val Gly
                                         1 5

aag cca cgt acc gca cag gaa atc cag cag gat tgg gac acc aac cct 163
Lys Pro Arg Thr Ala Gln Glu Ile Gln Gln Asp Trp Asp Thr Asn Pro
                        10                        15                        20

cgt tgg aac ggc atc acc cgc gac tac acc gca gac cag gta gct gat 211
Arg Trp Asn Gly Ile Thr Arg Asp Tyr Thr Ala Asp Gln Val Ala Asp
                        25                        30                        35

ctg cag ggt tcc gtc atc gag gag cac act ctt gct cgc cgc ggc tca 259
Leu Gln Gly Ser Val Ile Glu Glu His Thr Leu Ala Arg Arg Gly Ser
                        40                        45                        50

gag atc ctc tgg gac gca gtc acc cag gaa ggt gac gga tac atc aac 307
Glu Ile Leu Trp Asp Ala Val Thr Gln Glu Gly Asp Gly Tyr Ile Asn
                        55                        60                        65

gcg ctt ggc gca ctc acc ggt aac cag gct gtt cag cag gtt cgt gca 355
Ala Leu Gly Ala Leu Thr Gly Asn Gln Ala Val Gln Gln Val Arg Ala
                        70                        75                        80                        85

ggc ctg aag gct gtc tac ctg tcc ggt tgg cag gtc gca ggt gac gcc 403
Gly Leu Lys Ala Val Tyr Leu Ser Gly Trp Gln Val Ala Gly Asp Ala
                        90                        95                        100

aac ctc tcc ggc cac acc tac cct gac cag tcc ctc tac cca gcg aac 451
Asn Leu Ser Gly His Thr Tyr Pro Asp Gln Ser Leu Tyr Pro Ala Asn
                        105                        110                        115

tcc gtt cca agc gtc gtt cgt cgc atc aac aac gca ctg ctg cgt tcc 499
Ser Val Pro Ser Val Val Arg Arg Ile Asn Asn Ala Leu Leu Arg Ser
                        120                        125                        130

gat gaa atc gca cgc acc gaa ggc gac acc tcc gtt gac aac tgg gtt 547
Asp Glu Ile Ala Arg Thr Glu Gly Asp Thr Ser Val Asp Asn Trp Val
                        135                        140                        145

gtc cca atc gtc gcg gac ggc gaa gct ggc ttc ggt gga gca ctc aac 595
Val Pro Ile Val Ala Asp Gly Glu Ala Gly Phe Gly Gly Ala Leu Asn
                        150                        155                        160                        165

gtc tac gaa ctc cag aag gca atg atc gca gct ggc gct gca ggc acc 643
Val Tyr Glu Leu Gln Lys Ala Met Ile Ala Ala Gly Ala Ala Gly Thr
                        170                        175                        180

cac tgg gaa gac cag ctc gct tct gaa aag aag tgt ggc cac ctc ggc 691
His Trp Glu Asp Gln Leu Ala Ser Glu Lys Lys Cys Gly His Leu Gly
                        185                        190                        195

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 Gly Lys Val Leu Ile Pro Thr Gln Gln His Ile Arg Thr Leu Asn Ser
 200 205 210

gcc cgc ctt gca gca gac gtt gca aac acc cca act gtt gtt atc gca 787
 Ala Arg Leu Ala Ala Asp Val Ala Asn Thr Pro Thr Val Val Ile Ala
 215 220 225

cgt acc gac gct gag gca gca acc ctg atc acc tct gac gtt gat gag 835
 Arg Thr Asp Ala Glu Ala Ala Thr Leu Ile Thr Ser Asp Val Asp Glu
 230 235 240 245

cgc gac caa cca ttc atc acc ggt gag cgc acc gca gaa ggc tac tac 883
 Arg Asp Gln Pro Phe Ile Thr Gly Glu Arg Thr Ala Glu Gly Tyr Tyr
 250 255 260

cac gtc aag aat ggt ctc gag cca tgt atc gca cgt gca aag tcc tac 931
 His Val Lys Asn Gly Leu Glu Pro Cys Ile Ala Arg Ala Lys Ser Tyr
 265 270 275

gca cca tac gca gat atg atc tgg atg gag acc ggc acc cct gac ctg 979
 Ala Pro Tyr Ala Asp Met Ile Trp Met Glu Thr Gly Thr Pro Asp Leu
 280 285 290

gag ctc gct aag aag ttc gct gaa ggc gtt cgc tct gag ttc cca gac 1027
 Glu Leu Ala Lys Lys Phe Ala Glu Gly Val Arg Ser Glu Phe Pro Asp
 295 300 305

cag ctg ctg tcc tac aac tgc tcc cca tcc ttc aac tgg tct gca cac 1075
 Gln Leu Leu Ser Tyr Asn Cys Ser Pro Ser Phe Asn Trp Ser Ala His
 310 315 320 325

ctc gag gca gat gag atc gct aag ttc cag aag gaa ctc ggc gca atg 1123
 Leu Glu Ala Asp Glu Ile Ala Lys Phe Gln Lys Glu Leu Gly Ala Met
 330 335 340

ggc ttc aag ttc cag ttc atc acc ctc gca ggc ttc cac tcc ctc aac 1171
 Gly Phe Lys Phe Gln Phe Ile Thr Leu Ala Gly Phe His Ser Leu Asn
 345 350 355

tac ggc atg ttc gac ctg gct tac gga tac gct cgc gaa ggc atg acc 1219
 Tyr Gly Met Phe Asp Leu Ala Tyr Gly Tyr Ala Arg Glu Gly Met Thr
 360 365 370

tcc ttc gtt gac ctg cag aac cgt gag ttc aag gca gct gaa gag cgt 1267
 Ser Phe Val Asp Leu Gln Asn Arg Glu Phe Lys Ala Ala Glu Glu Arg
 375 380 385

ggc ttc acc gct gtt aag cac cag cgt gag gtt ggc gca ggc tac ttc 1315
 Gly Phe Thr Ala Val Lys His Gln Arg Glu Val Gly Ala Gly Tyr Phe
 390 395 400 405

gac cag atc gca acc acc gtt gac ccg aac tct tct acc acc gct ttg 1363
 Asp Gln Ile Ala Thr Thr Val Asp Pro Asn Ser Ser Thr Thr Ala Leu
 410 415 420

aag ggt tcc act gaa gaa ggc cag ttc cac aac taggacctac aggttctgac 1416
 Lys Gly Ser Thr Glu Glu Gly Gln Phe His Asn
 425 430

aat 1419

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Asp Gln Val Ala Asp Leu Gln Gly Ser Val Ile Glu Glu His Thr Leu
 35 40 45

Ala Arg Arg Gly Ser Glu Ile Leu Trp Asp Ala Val Thr Gln Glu Gly
 50 55 60

Asp Gly Tyr Ile Asn Ala Leu Gly Ala Leu Thr Gly Asn Gln Ala Val
 65 70 75 80

Gln Gln Val Arg Ala Gly Leu Lys Ala Val Tyr Leu Ser Gly Trp Gln
 85 90 95

Val Ala Gly Asp Ala Asn Leu Ser Gly His Thr Tyr Pro Asp Gln Ser
 100 105 110

Leu Tyr Pro Ala Asn Ser Val Pro Ser Val Val Arg Arg Ile Asn Asn
 115 120 125

Ala Leu Leu Arg Ser Asp Glu Ile Ala Arg Thr Glu Gly Asp Thr Ser
 130 135 140

Val Asp Asn Trp Val Val Pro Ile Val Ala Asp Gly Glu Ala Gly Phe
 145 150 155 160

Gly Gly Ala Leu Asn Val Tyr Glu Leu Gln Lys Ala Met Ile Ala Ala
 165 170 175

Gly Ala Ala Gly Thr His Trp Glu Asp Gln Leu Ala Ser Glu Lys Lys
 180 185 190

Cys Gly His Leu Gly Gly Lys Val Leu Ile Pro Thr Gln Gln His Ile
 195 200 205

Arg Thr Leu Asn Ser Ala Arg Leu Ala Ala Asp Val Ala Asn Thr Pro
 210 215 220

Thr Val Val Ile Ala Arg Thr Asp Ala Glu Ala Ala Thr Leu Ile Thr
 225 230 235 240

Ser Asp Val Asp Glu Arg Asp Gln Pro Phe Ile Thr Gly Glu Arg Thr
 245 250 255

Ala Glu Gly Tyr Tyr His Val Lys Asn Gly Leu Glu Pro Cys Ile Ala
 260 265 270

Arg Ala Lys Ser Tyr Ala Pro Tyr Ala Asp Met Ile Trp Met Glu Thr
 275 280 285

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Ala Asn Thr Ala Trp Val Pro Ser Pro Thr Gly Ala Thr Leu His Ala			
550	555	560	565
acg cac tac cac ttg gtt gat gtg ttc aag gtt caa gac gaa ctg cgt			1843
Thr His Tyr His Leu Val Asp Val Phe Lys Val Gln Asp Glu Leu Arg			
	570	575	580
gct gcc ggc cgc cgc gac agc ctg cgc aac att ctc acc att tca acc			1891
Ala Ala Gly Arg Arg Asp Ser Leu Arg Asn Ile Leu Thr Ile Ser Thr			
	585	590	595
gca cca aac acc aat tgg tct gag gaa gag aag aag gaa gag atg gac			1939
Ala Pro Asn Thr Asn Trp Ser Glu Glu Lys Lys Glu Glu Met Asp			
	600	605	610
aac aac tgc cag tcc atc ctc gga tac gtt gtg cgc tgg gtt gag cac			1987
Asn Asn Cys Gln Ser Ile Leu Gly Tyr Val Val Arg Trp Val Glu His			
	615	620	625
ggt gtt ggt tgc tcc aag gtt cca gac atc cat gac atc gac ctc atg			2035
Gly Val Gly Cys Ser Lys Val Pro Asp Ile His Asp Ile Asp Leu Met			
	630	635	640
gaa gac cgc gca acg ctg cgt att tcc tcg cag atg ctg gcc aac tgg			2083
Glu Asp Arg Ala Thr Leu Arg Ile Ser Ser Gln Met Leu Ala Asn Trp			
	650	655	660
atc cgc cat gat gtt gtc tcg aag gag cag gtc ttg gag tca ctg gaa			2131
Ile Arg His Asp Val Val Ser Lys Glu Gln Val Leu Glu Ser Leu Glu			
	665	670	675
cga atg gca gtg gtc gtc gac aag caa aat gcg ggc gac gag gcc tac			2179
Arg Met Ala Val Val Val Asp Lys Gln Asn Ala Gly Asp Glu Ala Tyr			
	680	685	690
cgc gat atg gcg ccg aag tac gac gcc tcc ctc gcc ttc cag gcg gct			2227
Arg Asp Met Ala Pro Lys Tyr Asp Ala Ser Leu Ala Phe Gln Ala Ala			
	695	700	705
aag gac ttg att ttc gaa ggc acc aag tcc cca tcg ggc tac acc gag			2275
Lys Asp Leu Ile Phe Glu Gly Thr Lys Ser Pro Ser Gly Tyr Thr Glu			
	710	715	720
ccc atc ttg cac gca cgc cgc cgc gag ttc aaa gca aaa aac			2317
Pro Ile Leu His Ala Arg Arg Arg Glu Phe Lys Ala Lys Asn			
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<210> 594

<211> 739

<212> PRT

<213> Corynebacterium glutamicum

<400> 594

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002290"0420960

Thr Asp Ser Thr Glu Arg Val Asp Ala Gly Gly Met Gln Val Ala Lys
 20 25 30
 Val Leu Tyr Asp Phe Val Thr Glu Ala Val Leu Pro Arg Val Gly Val
 35 40 45
 Asp Ala Glu Lys Phe Trp Ser Gly Phe Ala Ala Ile Ala Arg Asp Leu
 50 55 60
 Thr Pro Arg Asn Arg Glu Leu Leu Ala Arg Arg Asp Glu Leu Gln Met
 65 70 75 80
 Leu Ile Asp Asp Tyr His Arg Asn Asn Ser Gly Thr Ile Asp Gln Glu
 85 90 95
 Ala Tyr Glu Asp Phe Leu Lys Glu Ile Gly Tyr Leu Val Glu Glu Pro
 100 105 110
 Glu Ala Ala Glu Ile Arg Thr Gln Asn Val Asp Thr Glu Ile Ser Ser
 115 120 125
 Thr Ala Gly Pro Gln Leu Val Val Pro Ile Leu Asn Ala Arg Phe Ala
 130 135 140
 Leu Asn Ala Ala Asn Ala Arg Trp Gly Ser Leu Tyr Asp Ala Leu Tyr
 145 150 155 160
 Gly Thr Asn Ala Ile Pro Glu Thr Asp Gly Ala Glu Lys Gly Lys Glu
 165 170 175
 Tyr Asn Pro Val Arg Gly Gln Lys Val Ile Glu Trp Gly Arg Glu Phe
 180 185 190
 Leu Asp Ser Val Val Pro Leu Asp Gly Ala Ser His Ala Asp Val Glu
 195 200 205
 Lys Tyr Asn Ile Thr Asp Gly Lys Leu Ala Ala His Ile Gly Asp Ser
 210 215 220
 Val Tyr Arg Leu Lys Asn Arg Glu Ser Tyr Arg Gly Phe Thr Gly Asn
 225 230 235 240
 Phe Leu Asp Pro Glu Ala Ile Leu Leu Glu Thr Asn Gly Leu His Ile
 245 250 255
 Glu Leu Gln Ile Asp Pro Val His Pro Ile Gly Lys Ala Asp Lys Thr
 260 265 270
 Gly Leu Lys Asp Ile Val Leu Glu Ser Ala Ile Thr Thr Ile Met Asp
 275 280 285
 Phe Glu Asp Ser Val Ala Ala Val Asp Ala Glu Asp Lys Thr Leu Gly
 290 295 300
 Tyr Ser Asn Trp Phe Gly Leu Asn Thr Gly Glu Leu Lys Glu Glu Met
 305 310 315 320
 Ser Lys Asn Gly Arg Ile Phe Thr Arg Glu Leu Asn Lys Asp Arg Val
 325 330 335

002290 0420960

Asn	Lys	Met	Arg	Asn	Ser	Arg	Lys	Gly	Ser	Ile	Tyr	Ile	Val	Lys	Pro		
	370					375					380						
aag	cag	cac	ggc	cct	gaa	gaa	gtc	gcg	ttc	acc	aac	gag	ctc	ttc	ggc	1200	
Lys	Gln	His	Gly	Pro	Glu	Glu	Val	Ala	Phe	Thr	Asn	Glu	Leu	Phe	Gly		
385					390					395					400		
cgc	gtt	gag	gat	ctg	ctt	gat	ctg	cca	cgc	cac	acc	ttg	aag	gtt	ggt	1248	
Arg	Val	Glu	Asp	Leu	Leu	Asp	Leu	Pro	Arg	His	Thr	Leu	Lys	Val	Gly		
				405					410					415			
gtt	atg	gat	gag	gag	cgt	cgc	acg	tcc	gtg	aac	ctg	gat	gcc	agc	atc	1296	
Val	Met	Asp	Glu	Glu	Arg	Arg	Thr	Ser	Val	Asn	Leu	Asp	Ala	Ser	Ile		
			420					425					430				
atg	gaa	gtt	gct	gac	cgc	ttg	gca	ttc	atc	aac	act	ggc	ttc	ctg	gac	1344	
Met	Glu	Val	Ala	Asp	Arg	Leu	Ala	Phe	Ile	Asn	Thr	Gly	Phe	Leu	Asp		
		435					440					445					
cgc	acc	ggc	gat	gaa	atc	cac	acc	tcc	atg	gaa	gca	ggc	gcc	atg	gtg	1392	
Arg	Thr	Gly	Asp	Glu	Ile	His	Thr	Ser	Met	Glu	Ala	Gly	Ala	Met	Val		
	450					455					460						
cgc	aag	gct	gat	atg	cag	acc	gca	ccg	tgg	aag	cag	gcc	tac	gag	aac	1440	
Arg	Lys	Ala	Asp	Met	Gln	Thr	Ala	Pro	Trp	Lys	Gln	Ala	Tyr	Glu	Asn		
465					470					475					480		
aac	aac	gtt	gat	gca	ggt	att	cag	cg	ggt	ctt	cct	ggc	aag	gct	cag	1488	
Asn	Asn	Val	Asp	Ala	Gly	Ile	Gln	Arg	Gly	Leu	Pro	Gly	Lys	Ala	Gln		
				485					490					495			
atc	ggt	aag	ggc	atg	tgg	gcg	atg	act	gaa	ctc	atg	gca	gaa	atg	ctg	1536	
Ile	Gly	Lys	Gly	Met	Trp	Ala	Met	Thr	Glu	Leu	Met	Ala	Glu	Met	Leu		
			500					505					510				
gag	aag	aag	atc	ggc	cag	cca	cg	gaa	ggc	gcc	aac	act	gca	tgg	gtt	1584	
Glu	Lys	Lys	Ile	Gly	Gln	Pro	Arg	Glu	Gly	Ala	Asn	Thr	Ala	Trp	Val		
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cct	tca	cca	act	ggt	gcg	acg	ctg	cac	gca	acg	cac	tac	cac	ttg	gtt	1632	
Pro	Ser	Pro	Thr	Gly	Ala	Thr	Leu	His	Ala	Thr	His	Tyr	His	Leu	Val		
	530					535					540						
gat	gtg	ttc	aag	gtt	caa	gac	gaa	ctg	cg	gct	gcc	ggc	cg	cg	gac	1680	
Asp	Val	Phe	Lys	Val	Gln	Asp	Glu	Leu	Arg	Ala	Ala	Gly	Arg	Arg	Asp		
545					550					555					560		
agc	ctg	cg	aac	att	ctc	acc	att	tca	acc	gca	cca	aac	acc	aat	tgg	1728	
Ser	Leu	Arg	Asn	Ile	Leu	Thr	Ile	Ser	Thr	Ala	Pro	Asn	Thr	Asn	Trp		
				565					570					575			
tct	gag	gaa	gag	aag	aag	gaa	gag	atg	gac	aac	aac	tgc	cag	tcc	atc	1776	
Ser	Glu	Glu	Glu	Lys	Lys	Glu	Glu	Met	Asp	Asn	Asn	Cys	Gln	Ser	Ile		
			580					585					590				
ctc	gga	tac	gtt	gtg	cg	tgg	gtt	gag	cac	ggt	gtt	ggt	tgc	tcc	aag	1824	
Leu	Gly	Tyr	Val	Val	Arg	Trp	Val	Glu	His	Gly	Val	Gly	Cys	Ser	Lys		
		595					600					605					
gtt	cca	gac	atc	cat	gac	atc	gac	ctc	atg	gaa	gac	cg	gca	acg	ctg	1872	
Val	Pro	Asp	Ile	His	Asp	Ile	Asp	Leu	Met	Glu	Asp	Arg	Ala	Thr	Leu		

002240 062300

610 615 620
 cgt att tcc tcg cag atg ctg gcc aac tgg atc cgc cat gat gtt gtc 1920
 Arg Ile Ser Ser Gln Met Leu Ala Asn Trp Ile Arg His Asp Val Val
 625 630 635 640
 tcg aag gag cag gtc ttg gag tca ctg gaa cga atg gca gtg gtc gtc 1968
 Ser Lys Glu Gln Val Leu Glu Ser Leu Glu Arg Met Ala Val Val Val
 645 650 655
 gac aag caa aat gcg ggc gac gag gcc tac cgc gat atg gcg ccg aag 2016
 Asp Lys Gln Asn Ala Gly Asp Glu Ala Tyr Arg Asp Met Ala Pro Lys
 660 665 670
 tac gac gcc tcc ctc gcc ttc cag gcg gct aag gac ttg att ttc gaa 2064
 Tyr Asp Ala Ser Leu Ala Phe Gln Ala Ala Lys Asp Leu Ile Phe Glu
 675 680 685
 ggc acc aag tcc cca tcg ggc tac acc gag ccc atc ttg cac gca cgc 2112
 Gly Thr Lys Ser Pro Ser Gly Tyr Thr Glu Pro Ile Leu His Ala Arg
 690 695 700
 cgc cgc gag ttc aaa gca aaa aac taagcacgct tttcgacgct tac 2159
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 20 25 30
 Ile Ala Arg Asp Leu Thr Pro Arg Asn Arg Glu Leu Leu Ala Arg Arg
 35 40 45
 Asp Glu Leu Gln Met Leu Ile Asp Asp Tyr His Arg Asn Asn Ser Gly
 50 55 60
 Thr Ile Asp Gln Glu Ala Tyr Glu Asp Phe Leu Lys Glu Ile Gly Tyr
 65 70 75 80
 Leu Val Glu Glu Pro Glu Ala Ala Glu Ile Arg Thr Gln Asn Val Asp
 85 90 95
 Thr Glu Ile Ser Ser Thr Ala Gly Pro Gln Leu Val Val Pro Ile Leu
 100 105 110
 Asn Ala Arg Phe Ala Leu Asn Ala Ala Asn Ala Arg Trp Gly Ser Leu
 115 120 125
 Tyr Asp Ala Leu Tyr Gly Thr Asn Ala Ile Pro Glu Thr Asp Gly Ala
 130 135 140
 Glu Lys Gly Lys Glu Tyr Asn Pro Val Arg Gly Gln Lys Val Ile Glu

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145 150 155 160
 Trp Gly Arg Glu Phe Leu Asp Ser Val Val Pro Leu Asp Gly Ala Ser
 165 170 175
 His Ala Asp Val Glu Lys Tyr Asn Ile Thr Asp Gly Lys Leu Ala Ala
 180 185 190
 His Ile Gly Asp Ser Val Tyr Arg Leu Lys Asn Arg Glu Ser Tyr Arg
 195 200 205
 Gly Phe Thr Gly Asn Phe Leu Asp Pro Glu Ala Ile Leu Leu Glu Thr
 210 215 220
 Asn Gly Leu His Ile Glu Leu Gln Ile Asp Pro Val His Pro Ile Gly
 225 230 235 240
 Lys Ala Asp Lys Thr Gly Leu Lys Asp Ile Val Leu Glu Ser Ala Ile
 245 250 255
 Thr Thr Ile Met Asp Phe Glu Asp Ser Val Ala Ala Val Asp Ala Glu
 260 265 270
 Asp Lys Thr Leu Gly Tyr Ser Asn Trp Phe Gly Leu Asn Thr Gly Glu
 275 280 285
 Leu Lys Glu Glu Met Ser Lys Asn Gly Arg Ile Phe Thr Arg Glu Leu
 290 295 300
 Asn Lys Asp Arg Val Tyr Ile Gly Arg Asn Gly Thr Glu Leu Val Leu
 305 310 315 320
 His Gly Arg Ser Leu Leu Phe Val Arg Asn Val Gly His Leu Met Gln
 325 330 335
 Asn Pro Ser Ile Leu Ile Asp Gly Glu Glu Ile Phe Glu Gly Ile Met
 340 345 350
 Asp Ala Val Leu Thr Thr Val Cys Ala Ile Pro Gly Ile Ala Pro Gln
 355 360 365
 Asn Lys Met Arg Asn Ser Arg Lys Gly Ser Ile Tyr Ile Val Lys Pro
 370 375 380
 Lys Gln His Gly Pro Glu Glu Val Ala Phe Thr Asn Glu Leu Phe Gly
 385 390 395 400
 Arg Val Glu Asp Leu Leu Asp Leu Pro Arg His Thr Leu Lys Val Gly
 405 410 415
 Val Met Asp Glu Glu Arg Arg Thr Ser Val Asn Leu Asp Ala Ser Ile
 420 425 430
 Met Glu Val Ala Asp Arg Leu Ala Phe Ile Asn Thr Gly Phe Leu Asp
 435 440 445
 Arg Thr Gly Asp Glu Ile His Thr Ser Met Glu Ala Gly Ala Met Val
 450 455 460
 Arg Lys Ala Asp Met Gln Thr Ala Pro Trp Lys Gln Ala Tyr Glu Asn
 465 470 475 480

00602740 062300

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Asn Asn Val Asp Ala Gly Ile Gln Arg Gly Leu Pro Gly Lys Ala Gln
    485                                490                                495

Ile Gly Lys Gly Met Trp Ala Met Thr Glu Leu Met Ala Glu Met Leu
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Glu Lys Lys Ile Gly Gln Pro Arg Glu Gly Ala Asn Thr Ala Trp Val
    515                                520                                525

Pro Ser Pro Thr Gly Ala Thr Leu His Ala Thr His Tyr His Leu Val
    530                                535                                540

Asp Val Phe Lys Val Gln Asp Glu Leu Arg Ala Ala Gly Arg Arg Asp
    545                                550                                555                                560

Ser Leu Arg Asn Ile Leu Thr Ile Ser Thr Ala Pro Asn Thr Asn Trp
    565                                570                                575

Ser Glu Glu Glu Lys Lys Glu Glu Met Asp Asn Asn Cys Gln Ser Ile
    580                                585                                590

Leu Gly Tyr Val Val Arg Trp Val Glu His Gly Val Gly Cys Ser Lys
    595                                600                                605

Val Pro Asp Ile His Asp Ile Asp Leu Met Glu Asp Arg Ala Thr Leu
    610                                615                                620

Arg Ile Ser Ser Gln Met Leu Ala Asn Trp Ile Arg His Asp Val Val
    625                                630                                635                                640

Ser Lys Glu Gln Val Leu Glu Ser Leu Glu Arg Met Ala Val Val Val
    645                                650                                655

Asp Lys Gln Asn Ala Gly Asp Glu Ala Tyr Arg Asp Met Ala Pro Lys
    660                                665                                670

Tyr Asp Ala Ser Leu Ala Phe Gln Ala Ala Lys Asp Leu Ile Phe Glu
    675                                680                                685

Gly Thr Lys Ser Pro Ser Gly Tyr Thr Glu Pro Ile Leu His Ala Arg
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Arg Arg Glu Phe Lys Ala Lys Asn
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<212> DNA

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<222> (101)..(850)

<223> RXA01089

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attagactca aggcatca cattgaagga gcttcttattc ttg tct cga ttt gct 115

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	Leu	Ser	Arg	Phe	Ala	
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gcc aac ctg tca ttg act ttt act gag cta gat ttc ctg gat cgt ttt 163	Ala	Asn	Leu	Ser	Leu	Thr
			10			15
						20
gat gcc gct tcg aag cat gct ttc agt gcc gtg gag ttt cag tac cct 211	Asp	Ala	Ala	Ser	Lys	His
			25			30
						35
tac gat ttc gat gtt caa gag att aaa cag cgt gct gat tcc gca ggt 259	Tyr	Asp	Phe	Asp	Val	Gln
		40			45	50
ctg ccc att gaa ctg ttc aat gcc cca cct ggg gat act ttt ggt ctt 307	Leu	Pro	Ile	Glu	Leu	Phe
	55				60	65
gcg gca ctg gct tcc cct gaa gac ttt caa caa tcc atc gag cag gcc 355	Ala	Ala	Leu	Ala	Ser	Pro
	70			75		80
						85
atc acg tac gcc aca gtg ttg aag cca aag aag atg cat gtc atg gct 403	Ile	Thr	Tyr	Ala	Thr	Val
			90			95
						100
ggc atc gcg gac gta acc tca gaa acc acg gcg cgc tat gtg gag aat 451	Gly	Ile	Ala	Asp	Val	Thr
			105			110
						115
att cgc tgg gct gcg cag caa cta gac aag ctc gac gtt gtc gtt gtt 499	Ile	Arg	Trp	Ala	Ala	Gln
		120			Gln	Leu
					125	130
att gaa cca att aat cac tat tcg gtt ccc ggt tat ttc ctg cac act 547	Ile	Glu	Pro	Ile	Asn	His
	135				140	145
tta gag cag gcg tat tgg ctt atc gac agc att gcc cac ccc aat gtg 595	Leu	Glu	Gln	Ala	Tyr	Trp
	150				155	160
						165
aag atc tta ttc gat act ttc cac ctt cag cag att cat ggc aat ctc 643	Lys	Ile	Leu	Phe	Asp	Thr
			170			175
						180
acc cgc cgc ctg cgc gag gtt cat ggc gca ggt ctt ttg gga cac gtg 691	Thr	Arg	Arg	Leu	Arg	Glu
			185			190
						195
caa gtg gcc tca gtt cct gat cga cac gaa cct ggc act ggc gaa gtc 739	Gln	Val	Ala	Ser	Val	Pro
		200				205
						210
aat gcg gcg tat atc ttc caa ctc cta agc gaa ctg gga tat gac ggt 787	Asn	Ala	Ala	Tyr	Ile	Phe
	215				220	225
gtc atc gct ggc gaa tac cac cct gct ggt gaa act aca gcc ggt ttg 835	Val	Ile	Ala	Gly	Glu	Tyr
					His	Pro
					Ala	Gly
					Leu	

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<223> RXA01886
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060720Z

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Ile Gly Glu Gly Asn Leu Ile Glu Leu Leu Arg Glu Ala Gln Pro Phe
      185                      190                      195

atc ggc gaa atc cag gtt gcc gat gtc ccc ggc cgc atg gaa ccc ggc 739
Ile Gly Glu Ile Gln Val Ala Asp Val Pro Gly Arg Met Glu Pro Gly
      200                      205                      210

acc ggc gag atc aac tac cag ggc gtc gcg aaa gct ctc gcc gcg atg 787
Thr Gly Glu Ile Asn Tyr Gln Gly Val Ala Lys Ala Leu Ala Ala Met
      215                      220                      225

ggc tac gac ggc gtc atc ggc atg gag gcg tgg gca tcg ggc gac tcc 835
Gly Tyr Asp Gly Val Ile Gly Met Glu Ala Trp Ala Ser Gly Asp Ser
      230                      235                      240                      245

agc gac gcg ctg cag gcg ttg aag tca gcg ttc acg gtc taaattgctt 884
Ser Asp Ala Leu Gln Ala Leu Lys Ser Ala Phe Thr Val
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atcgacgcac ccc 897

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Pro Phe Glu Glu Arg Val Lys Thr Ile Ser Asp Gln Gly Phe Leu Val
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Glu Ile Trp Asp Trp Ser Thr Lys Asp Ile Asp Ala Leu Val Ala Thr
      35              40              45

Gly Ala Glu Phe Ser Ser Met Thr Gly Tyr Leu Arg Gly Asp Leu Ile
      50              55              60

Thr Glu Gln Gly Arg Ala Glu Leu Leu Ala Thr Ala Ser Glu Ser Leu
      65              70              75              80

Ala Val Ala Glu Lys Leu Asn Cys Pro Arg Leu Asn Leu His Gly Thr
      85              90              95

Gly Leu Gly Pro Gln Gly Leu Pro Val Thr Pro Ile Glu Val Val Thr
      100             105             110

Pro Glu Met Trp Leu Tyr Ala Ala Glu Thr Leu Arg Gln Ile Ala Glu
      115             120             125

Leu Gly Glu Arg Ala Gly Lys Val Phe Val Leu Glu Asn Leu Asn Leu
      130             135             140

Ala Val Asp His Pro Gly Thr Pro Phe Ala Lys Ala Thr Asp Thr Leu
      145             150             155             160

Ala Leu Val Lys Ala Val Asn His Pro Asn Leu Arg Leu Asn Leu Asp

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Met Ile Thr His Glu															
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Val Arg Thr His Arg Ser Ala Glu Glu Phe Pro Tyr Lys Lys His Leu															
10 15 20															
gct cac aag atg gct cgc gtt gca gcc gac cca gtt gag gtt gct gcg															151
Ala His Lys Met Ala Arg Val Ala Ala Asp Pro Val Glu Val Ala Ala															
25 30 35															
gac act cag gaa atg atc atc acc cgc atc atc gac aat gca tcg gtg															199
Asp Thr Gln Glu Met Ile Ile Thr Arg Ile Ile Asp Asn Ala Ser Val															
40 45 50															
cag gca gct tcc gtg ttg cgt cga cca gtt agc tct gcc cgt gcg atg															247
Gln Ala Ala Ser Val Leu Arg Arg Pro Val Ser Ser Ala Arg Ala Met															
55 60 65															
gca cag gtc agg cca gtt acc gat ggt cgg ggt gca tct gtt ttc ggt															295
Ala Gln Val Arg Pro Val Thr Asp Gly Arg Gly Ala Ser Val Phe Gly															
70 75 80 85															
ctg cca gga cgt tat gcc gcg gaa tgg gct gcg ctt gct aac ggc act															343
Leu Pro Gly Arg Tyr Ala Ala Glu Trp Ala Ala Leu Ala Asn Gly Thr															
90 95 100															
gcg gtg cgt gag ctt gat ttc cat gac acg ttc ctc gct gcg gaa tac															391

Ser Ala Arg Ala Met Ala Gln Val Arg Pro Val Thr Asp Gly Arg Gly
 65 70 75 80
 Ala Ser Val Phe Gly Leu Pro Gly Arg Tyr Ala Ala Glu Trp Ala Ala
 85 90 95
 Leu Ala Asn Gly Thr Ala Val Arg Glu Leu Asp Phe His Asp Thr Phe
 100 105 110
 Leu Ala Ala Glu Tyr Ser His Pro Gly Asp Asn Ile Pro Pro Ile Leu
 115 120 125
 Ala Ala Ala Gln Gln Ala Gly Lys Gly Gly Lys Asp Leu Ile Arg Gly
 130 135 140
 Ile Ala Thr Gly Tyr Glu Ile Gln Val Asn Leu Val Arg Gly Met Cys
 145 150 155 160
 Leu His Glu His Lys Ile Asp His Val Ala His Leu Gly Pro Ser Ala
 165 170 175
 Ala Ala Gly Ile Gly Thr Leu Leu Asp Leu Asp Val Asp Thr Ile Tyr
 180 185 190
 Gln Ala Ile Gly Gln Ala Leu His Thr Thr Thr Ala Thr Arg Gln Ser
 195 200 205
 Arg Lys Gly Ala Ile Ser Ser Trp Lys Ala Phe Ala Pro Ala Phe Ala
 210 215 220
 Gly Lys Met Ser Ile Glu Ala Val Asp Arg Ala Met Arg Gly Glu Gly
 225 230 235 240
 Ala Pro Ser Pro Ile Trp Glu Gly Glu Asp Gly Val Ile Ala Trp Leu
 245 250 255
 Leu Ser Gly Leu Asp His Ile Tyr Thr Ile Pro Leu Pro Ala Glu Gly
 260 265 270
 Glu Ala Lys Arg Ala Ile Leu Asp Thr Tyr Thr Lys Glu His Ser Ala
 275 280 285
 Glu Tyr Gln Ser Gln Ala Pro Ile Asp Leu Ala Arg Ser Met Gly Glu
 290 295 300
 Lys Leu Ala Ala Gln Gly Leu Asp Leu Arg Asp Val Asp Ser Ile Val
 305 310 315 320
 Leu His Thr Ser His His Thr His Tyr Val Ile Gly Thr Gly Ser Asn
 325 330 335
 Asp Pro Gln Lys Phe Asp Pro Asp Ala Ser Arg Glu Thr Leu Asp His
 340 345 350
 Ser Ile Met Tyr Ile Phe Ala Val Ala Leu Lys Asp Arg Ala Trp His
 355 360 365
 His Glu Arg Ser Tyr Ala Pro Glu Arg Ala His Arg Arg Glu Thr Ile
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 Glu Leu Trp Asn Lys Ile Ser Thr Val Glu Asp Pro Glu Trp Thr Arg

09502740, 062300

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Arg	Gly	Ile	Ala	Thr	Gly	Tyr	Glu	Ile	Gln	Val	Asn	Leu	Val	Arg	Gly	
		115					120					125				
atg	tgc	ctg	cat	gag	cac	aag	att	gat	cac	gtt	gct	cat	ctt	gga	cca	432
Met	Cys	Leu	His	Glu	His	Lys	Ile	Asp	His	Val	Ala	His	Leu	Gly	Pro	
		130				135					140					
tca	gcg	gct	gct	ggg	atc	gga	acc	ttg	cta	gac	cta	gat	gtg	gac	acc	480
Ser	Ala	Ala	Ala	Gly	Ile	Gly	Thr	Leu	Leu	Asp	Leu	Asp	Val	Asp	Thr	
		145			150					155					160	
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Ile	Tyr	Gln	Ala	Ile	Gly	Gln	Ala	Leu	His	Thr	Thr	Thr	Ala	Thr	Arg	
				165				170						175		
cag	tcc	cgt	aaa	ggg	gcg	att	tct	tca	tgg	aag	gca	ttt	gct	cct	gcg	576
Gln	Ser	Arg	Lys	Gly	Ala	Ile	Ser	Ser	Trp	Lys	Ala	Phe	Ala	Pro	Ala	
			180					185					190			
ttt	gcg	ggc	aag	atg	tcc	atc	gag	gca	gta	gat	cgc	gca	atg	cgt	ggc	624
Phe	Ala	Gly	Lys	Met	Ser	Ile	Glu	Ala	Val	Asp	Arg	Ala	Met	Arg	Gly	
		195					200					205				
gag	ggc	gca	ccg	tca	cca	atc	tgg	gaa	ggc	gaa	gac	ggc	gta	atc	gcg	672
Glu	Gly	Ala	Pro	Ser	Pro	Ile	Trp	Glu	Gly	Glu	Asp	Gly	Val	Ile	Ala	
		210				215					220					
tgg	ctg	ctg	tcc	ggg	ctt	gat	cac	atc	tac	acc	att	cct	ttg	cct	gca	720
Trp	Leu	Leu	Ser	Gly	Leu	Asp	His	Ile	Tyr	Thr	Ile	Pro	Leu	Pro	Ala	
					230					235					240	
gaa	ggg	gaa	gcc	aaa	cga	gca	atc	ttg	gat	acc	tac	acc	aag	gaa	cac	768
Glu	Gly	Glu	Ala	Lys	Arg	Ala	Ile	Leu	Asp	Thr	Tyr	Thr	Lys	Glu	His	
				245				250						255		
tcg	gcg	gaa	tac	cag	tca	cag	gca	ccg	atc	gac	ttg	gcg	cgc	agc	atg	816
Ser	Ala	Glu	Tyr	Gln	Ser	Gln	Ala	Pro	Ile	Asp	Leu	Ala	Arg	Ser	Met	
			260					265					270			
ggg	gag	aag	ctg	gca	gca	cag	ggc	ttg	gac	ctg	cgt	gat	gtg	gac	tcc	864
Gly	Glu	Lys	Leu	Ala	Ala	Gln	Gly	Leu	Asp	Leu	Arg	Asp	Val	Asp	Ser	
		275				280						285				
atc	gtt	ttg	cac	acc	tcc	cac	cac	act	cac	tac	gtg	atc	ggc	acc	gga	912
Ile	Val	Leu	His	Thr	Ser	His	His	Thr	His	Tyr	Val	Ile	Gly	Thr	Gly	
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Ser	Asn	Asp	Pro	Gln	Lys	Phe	Asp	Pro	Asp	Ala	Ser	Arg	Glu	Thr	Leu	
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gat	cac	tcc	atc	atg												975
Asp	His	Ser	Ile	Met												
				325												

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<212> PRT

<213> *Corynebacterium glutamicum*

<400> 604

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Val Ser Ser Ala Arg Ala Met Ala Gln Val Arg Pro Val Thr Asp Gly
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Arg Gly Ala Ser Val Phe Gly Leu Pro Gly Arg Tyr Ala Ala Glu Trp
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Ala Ala Leu Ala Asn Gly Thr Ala Val Arg Glu Leu Asp Phe His Asp
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Thr Phe Leu Ala Ala Glu Tyr Ser His Pro Gly Asp Asn Ile Pro Pro
      85             90             95

Ile Leu Ala Ala Ala Gln Gln Ala Gly Lys Gly Gly Lys Asp Leu Ile
      100             105             110

Arg Gly Ile Ala Thr Gly Tyr Glu Ile Gln Val Asn Leu Val Arg Gly
 115             120             125

Met Cys Leu His Glu His Lys Ile Asp His Val Ala His Leu Gly Pro
 130             135             140

Ser Ala Ala Ala Gly Ile Gly Thr Leu Leu Asp Leu Asp Val Asp Thr
 145             150             155             160

Ile Tyr Gln Ala Ile Gly Gln Ala Leu His Thr Thr Thr Ala Thr Arg
      165             170             175

Gln Ser Arg Lys Gly Ala Ile Ser Ser Trp Lys Ala Phe Ala Pro Ala
      180             185             190

Phe Ala Gly Lys Met Ser Ile Glu Ala Val Asp Arg Ala Met Arg Gly
      195             200             205

Glu Gly Ala Pro Ser Pro Ile Trp Glu Gly Glu Asp Gly Val Ile Ala
 210             215             220

Trp Leu Leu Ser Gly Leu Asp His Ile Tyr Thr Ile Pro Leu Pro Ala
 225             230             235             240

Glu Gly Glu Ala Lys Arg Ala Ile Leu Asp Thr Tyr Thr Lys Glu His
      245             250             255

Ser Ala Glu Tyr Gln Ser Gln Ala Pro Ile Asp Leu Ala Arg Ser Met
      260             265             270

Gly Glu Lys Leu Ala Ala Gln Gly Leu Asp Leu Arg Asp Val Asp Ser
      275             280             285

Ile Val Leu His Thr Ser His His Thr His Tyr Val Ile Gly Thr Gly
 290             295             300

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Asp His Ser Ile Met
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<212> DNA

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<223> FRXA00514

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gag ctg tgg aac aag att tcc acg gtg gag gat cct gaa tgg acc agg 96
Glu Leu Trp Asn Lys Ile Ser Thr Val Glu Asp Pro Glu Trp Thr Arg
20 25 30

cgt tac cac tcc gtt gat cct gca gaa aag gcc ttc ggc gca cgc gca 144
Arg Tyr His Ser Val Asp Pro Ala Glu Lys Ala Phe Gly Ala Arg Ala
35 40 45

gtg atc acc ttc aag gat gga acc gtc gtg gaa gat gaa ctg gct gtg 192
Val Ile Thr Phe Lys Asp Gly Thr Val Val Glu Asp Glu Leu Ala Val
50 55 60

gcg aat gcg cat cct ctg gga gca cgg cct ttc gct agg gag cag tac 240
Ala Asn Ala His Pro Leu Gly Ala Arg Pro Phe Ala Arg Glu Gln Tyr
65 70 75 80

att cag aaa ttc cgc acc ttg gct gaa ggt gtt gtg tcc gaa aag gaa 288
Ile Gln Lys Phe Arg Thr Leu Ala Glu Gly Val Val Ser Glu Lys Glu
85 90 95

cag gat cgc ttc ttg gat gcg gca cag cgt acg cac gag ctt gag gat 336
Gln Asp Arg Phe Leu Asp Ala Ala Gln Arg Thr His Glu Leu Glu Asp
100 105 110

ctt tca gaa ctc aac att gaa ttg gat gcc gat att ttg gcc aag gct 384
Leu Ser Glu Leu Asn Ile Glu Leu Asp Ala Asp Ile Leu Ala Lys Ala
115 120 125

cct gtg att ccg gaa gga ctg ttc tgatggcggg tttgttttcc tct 431
Pro Val Ile Pro Glu Gly Leu Phe
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<212> PRT

<213> Corynebacterium glutamicum

<400> 606

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His Glu Arg Ser Tyr Ala Pro Glu Arg Ala Leu Arg Arg Glu Thr Ile
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 Glu Leu Trp Asn Lys Ile Ser Thr Val Glu Asp Pro Glu Trp Thr Arg
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 Arg Tyr His Ser Val Asp Pro Ala Glu Lys Ala Phe Gly Ala Arg Ala
 35 40 45
 Val Ile Thr Phe Lys Asp Gly Thr Val Val Glu Asp Glu Leu Ala Val
 50 55 60
 Ala Asn Ala His Pro Leu Gly Ala Arg Pro Phe Ala Arg Glu Gln Tyr
 65 70 75 80
 Ile Gln Lys Phe Arg Thr Leu Ala Glu Gly Val Val Ser Glu Lys Glu
 85 90 95
 Gln Asp Arg Phe Leu Asp Ala Ala Gln Arg Thr His Glu Leu Glu Asp
 100 105 110
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 115 120 125
 Pro Val Ile Pro Glu Gly Leu Phe
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 <223> RXA00512

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 Met Ser Ser Ala Thr 5
 acc act gat gtt cgc aaa ggg ctc tac gga gtc atc gcc gat tac acg 163
 Thr Thr Asp Val Arg Lys Gly Leu Tyr Gly Val Ile Ala Asp Tyr Thr 20
 gcc gtt tcc aaa gtc atg cca gag acc aat tca ctg acc tac cgt ggc 211
 Ala Val Ser Lys Val Met Pro Glu Thr Asn Ser Leu Thr Tyr Arg Gly 35
 tac gcg gtg gaa gat ttg gtg gaa aac tgc agc ttc gag gag gtg ttt 259
 Tyr Ala Val Glu Asp Leu Val Glu Asn Cys Ser Phe Glu Glu Val Phe 50
 tac ctc ctg tgg cac ggc gag ctg ccc act gcg caa caa ctt gcg gag 307
 Tyr Leu Leu Trp His Gly Glu Leu Pro Thr Ala Gln Gln Leu Ala Glu 65

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ttc aat gag cgt ggc cgt tcc tac cgc tcc ctg gat gcc ggt ttg atc 355
 Phe Asn Glu Arg Gly Arg Ser Tyr Arg Ser Leu Asp Ala Gly Leu Ile
 70 75 80 85

tcc ctg atc cac tct ttg ccc aaa gaa gcc cac ccg atg gat gtt atg 403
 Ser Leu Ile His Ser Leu Pro Lys Glu Ala His Pro Met Asp Val Met
 90 95 100

cgc acc gcg gtg tcc tac atg ggc acc aag gat tcc gag tat ttc acc 451
 Arg Thr Ala Val Ser Tyr Met Gly Thr Lys Asp Ser Glu Tyr Phe Thr
 105 110 115

acc gat tct gag cac atc cgc aaa gtt ggc cac acc ttg ttg gcg cag 499
 Thr Asp Ser Glu His Ile Arg Lys Val Gly His Thr Leu Leu Ala Gln
 120 125 130

ctt ccg atg gtg cta gcc atg gat att cgt cgc cgc aag ggc ctc gat 547
 Leu Pro Met Val Leu Ala Met Asp Ile Arg Arg Arg Lys Gly Leu Asp
 135 140 145

atc atc gcc cct gac tcc agc aag tca gtc gcc gaa aac ctg ctg tct 595
 Ile Ile Ala Pro Asp Ser Ser Lys Ser Val Ala Glu Asn Leu Leu Ser
 150 155 160 165

atg gtg ttt ggt act ggc ccg gaa tca cct gca tcc aac cca gct gac 643
 Met Val Phe Gly Thr Gly Pro Glu Ser Pro Ala Ser Asn Pro Ala Asp
 170 175 180

gtc cgc gat ttt gag aaa tca ctg atc ctc tac gcc gag cac tcc ttc 691
 Val Arg Asp Phe Glu Lys Ser Leu Ile Leu Tyr Ala Glu His Ser Phe
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aac gcc tcc acc ttc acc gcc cgc gtg 718
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<213> Corynebacterium glutamicum

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Leu Thr Tyr Arg Gly Tyr Ala Val Glu Asp Leu Val Glu Asn Cys Ser
 35 40 45

Phe Glu Glu Val Phe Tyr Leu Leu Trp His Gly Glu Leu Pro Thr Ala
 50 55 60

Gln Gln Leu Ala Glu Phe Asn Glu Arg Gly Arg Ser Tyr Arg Ser Leu
 65 70 75 80

Asp Ala Gly Leu Ile Ser Leu Ile His Ser Leu Pro Lys Glu Ala His
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 Pro Asn Leu Asp Phe Pro Ala Gly Pro Ala Tyr His Leu Leu Gly Phe
 35 40 45
 Pro Val Asp Phe Phe Thr Pro Leu Phe Val Ile Ala Arg Val Ala Gly
 50 55 60
 Trp Thr Ala His Ile Val Glu Gln Tyr Glu Asn Asn Ser Leu Ile Arg
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 Glu Lys Arg

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 aatgaaggca agccaaactt aactagtaga taggattgca atg acc gaa tcg caa 115
 Met Thr Glu Ser Gln
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 gat ctc gcc gca ttc gtg gaa gct gcc aaa ctc aat gat gca agc ccc 163
 Asp Leu Ala Ala Phe Val Glu Ala Ala Lys Leu Asn Asp Ala Ser Pro
 10 15 20
 gaa gcc gta gag caa ttg aaa atc aga gtg cta gac acc gta ggc gtt 211
 Glu Ala Val Glu Gln Leu Lys Ile Arg Val Leu Asp Thr Val Gly Val
 25 30 35
 gcc att ggc gca ctg gat gcc gaa ccg att gtc gcc att cga gga ctc 259
 Ala Ile Gly Ala Leu Asp Ala Glu Pro Ile Val Ala Ile Arg Gly Leu
 40 45 50
 ctg gaa gac ctc ggg gga acc gaa cag tca aca ctt att ggt ggt ggc 307
 Leu Glu Asp Leu Gly Gly Thr Glu Gln Ser Thr Leu Ile Gly Gly Gly
 55 60 65

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Lys Thr Ser Pro Glu Arg Ala Ala Phe Phe Asn Ser Ala Leu Ser Arg	
70 75 80 85	
tac ctc gac ttc atg gac gcc tac cta gca aag ggc gaa acc aac cac	403
Tyr Leu Asp Phe Met Asp Ala Tyr Leu Ala Lys Gly Glu Thr Asn His	
90 95 100	
ccc tcg gat aac ttc gga gca gtg ctc gct gca gcc gaa agc gtt ggc	451
Pro Ser Asp Asn Phe Gly Ala Val Leu Ala Ala Ala Glu Ser Val Gly	
105 110 115	
gcc tct gga aaa gac ctg ctc acc gca ttc gcc gtg gcc tac cag gta	499
Ala Ser Gly Lys Asp Leu Leu Thr Ala Phe Ala Val Ala Tyr Gln Val	
120 125 130	
cac acc aga ctt tca gat gtc gca cca gtt cgc gcc aaa ggt ttc gat	547
His Thr Arg Leu Ser Asp Val Ala Pro Val Arg Ala Lys Gly Phe Asp	
135 140 145	
cac acc acc caa gga gca ttc gca gcg ggc gca tct gct gcc aag gca	595
His Thr Thr Gln Gly Ala Phe Ala Ala Gly Ala Ser Ala Ala Lys Ala	
150 155 160 165	
ctg ggt ttg cca gct gat caa atc gcc aac gca ctg gcc atc gca gga	643
Leu Gly Leu Pro Ala Asp Gln Ile Ala Asn Ala Leu Ala Ile Ala Gly	
170 175 180	
aca gcc aat gtt gca ctt cgt gtc act cgc act gga aac ttg agc cac	691
Thr Ala Asn Val Ala Leu Arg Val Thr Arg Thr Gly Asn Leu Ser His	
185 190 195	
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Trp Lys Gly Leu Ala Tyr Pro His Val Ser Lys Glu Gly Thr Trp Ala	
200 205 210	
gca ctg ctc gca agc cga ggt att acc ggt ccg gaa gaa gtc ttc gaa	787
Ala Leu Leu Ala Ser Arg Gly Ile Thr Gly Pro Glu Glu Val Phe Glu	
215 220 225	
ggc aac aag gga ttc aaa gag tcc gtc tcc gga ccg ttc gag atc gat	835
Gly Asn Lys Gly Phe Lys Glu Ser Val Ser Gly Pro Phe Glu Ile Asp	
230 235 240 245	
tgg tcc aag gaa gac ttg gaa agc gtt aag cgc acc atc atc aag aaa	883
Trp Ser Lys Glu Asp Leu Glu Ser Val Lys Arg Thr Ile Ile Lys Lys	
250 255 260	
cac aac gcg gaa att cac tcg cag tca gcg ctt gat gca gcc caa gaa	931
His Asn Ala Glu Ile His Ser Gln Ser Ala Leu Asp Ala Ala Gln Glu	
265 270 275	
ata cgc gca caa gaa ggc ttc aat gtg gac aac att gaa aag att cac	979
Ile Arg Ala Gln Glu Gly Phe Asn Val Asp Asn Ile Glu Lys Ile His	
280 285 290	
ctg act act ttc gac gtt gcc tac tcc atc att ggc ggc ggc gaa gaa	1027
Leu Thr Thr Phe Asp Val Ala Tyr Ser Ile Ile Gly Gly Gly Glu Glu	
295 300 305	

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Glu	His	Ile	Ala	Glu	Ile	Val	Leu	Arg	Thr	Ser	His	His	Thr	His	Tyr
				115					120					125	
Val	Ile	Gly	Thr	Gly	Ala	Asn	Asp	Pro	Gln	Lys	Met	Asp	Pro	Gln	Ala
				130					135					140	
Ser	Arg	Glu	Thr	Leu	Asp	His	Ser	Ile	Met	Tyr	Ile	Phe	Ala	Val	Ala
				145					150					155	160
Leu	Gln	Asp	Gly	Val	Trp	His	His	Glu	Phe	Ser	Tyr	Thr	Arg	Lys	Arg
				165					170					175	
Ser	Thr	Arg	Pro	Glu	Thr	Val	Glu	Leu	Trp	His	Lys	Ile	Arg	Thr	Val
				180					185					190	
Glu	Asp	Pro	Glu	Trp	Thr	Arg	Arg	Tyr	His	Ser	Asp	Asp	Pro	Ala	Lys
				195					200					205	
Lys	Ala	Phe	Gly	Ala	Lys	Ala	Val	Ile	Thr	Met	Ala	Asp	Gly	Thr	Val
				210					215					220	
Ile	Glu	Asp	Glu	Leu	Ala	Val	Ala	Asp	Ala	His	Pro	Leu	Gly	Ala	Arg
				225					230					235	240
Pro	Phe	Ala	Arg	Glu	Asn	Tyr	Ile	Glu	Lys	Phe	Arg	Thr	Leu	Ala	Gln
				245					250					255	
Gly	Ile	Val	Ile	Asp	Ser	Glu	Gln	Glu	Arg	Phe	Leu	His	Ala	Val	Gln
				260					265					270	
Ser	Leu	Pro	Asp	Leu	Asp	Asp	Leu	Asp	Gln	Leu	Asn	Ile	Glu	Val	Asp
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Met Arg Ile His Asp
1 5

Asn Gly Val Ala Val Arg Glu Leu Asp Phe His Asp Thr Phe Leu Ala
100 105 110

Ala Glu Tyr Ser His Pro Gly Asp Asn Ile Pro Pro Leu Leu Ala Val
115 120 125

Ala Gln Ala Gln Arg Ser Ser Gly Arg
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<211> 603

<212> DNA

<213> Corynebacterium glutamicum

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<221> CDS

<222> (1)..(603)

<223> RXA02329

<400> 617

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Phe Ala Pro Ala Phe Ala Gly Lys Met Ala Ile Glu Ala Met Asp Arg
20 25 30

gcg atg cgt ggg gag ggt tcg ccc gca ccg att tgg gag ggc gaa gac 144
Ala Met Arg Gly Glu Gly Ser Pro Ala Pro Ile Trp Glu Gly Glu Asp
35 40 45

ggg gtc atc gcg tgg ctg tta tcg ggc aaa gat cat gtt tat cat gtg 192
Gly Val Ile Ala Trp Leu Leu Ser Gly Lys Asp His Val Tyr His Val
50 55 60

cca ttg ccg gaa cac ggc gag ccc aag ctg ggg att cta gag act tac 240
Pro Leu Pro Glu His Gly Glu Pro Lys Leu Gly Ile Leu Glu Thr Tyr
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aca aag gaa cat tca gcg gaa tat caa tcg cag gca ccg att gat ctg 288
Thr Lys Glu His Ser Ala Glu Tyr Gln Ser Gln Ala Pro Ile Asp Leu
85 90 95

gcg cgc agg atg aag cca ctg gtt gac gcg gct ggc gga acg gaa cac 336
Ala Arg Arg Met Lys Pro Leu Val Asp Ala Ala Gly Gly Thr Glu His
100 105 110

att gca gag att gtg ctg cgc acc agt cac cac acg cat tat gtg att 384
Ile Ala Glu Ile Val Leu Arg Thr Ser His His Thr His Tyr Val Ile
115 120 125

ggc act ggg gcg aac gat ccg cag aag atg gat ccg cag gcc tcg cgt 432
Gly Thr Gly Ala Asn Asp Pro Gln Lys Met Asp Pro Gln Ala Ser Arg
130 135 140

gaa acc ctg gat cat tcc atc atg tac att ttc gcc gtc gcg ctt caa 480
Glu Thr Leu Asp His Ser Ile Met Tyr Ile Phe Ala Val Ala Leu Gln
145 150 155 160

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	340		345		350
Gln Phe Glu Asn Asn Ala Leu Ile Arg Pro Leu Ser Ala Tyr Asn Gly					
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 <223> RXN02333

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 Met Asn Leu Phe Ser
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 aat ggt gtt gat gtg ggg agg cgt cga caa gca ttt aaa gcg gca ctc 163
 Asn Gly Val Asp Val Gly Arg Arg Arg Gln Ala Phe Lys Ala Ala Leu
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 Ala Ala Pro His Ile Ala Arg Leu Pro Gly Ala Phe Ser Pro Leu Ile
 25 30 35
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 Ala Arg Ser Ile Glu Glu Ala Gly Phe Glu Gly Val Tyr Val Ser Gly
 40 45 50
 gcc gtc ata gct gct gac ctg gca cta ccc gat atc ggc ttg acg acg 307
 Ala Val Ile Ala Ala Asp Leu Ala Leu Pro Asp Ile Gly Leu Thr Thr
 55 60 65
 ctg acc gaa gtc gcc cac cgc gcg cgg caa att gcg cgc gtc aca gac 355
 Leu Thr Glu Val Ala His Arg Ala Arg Gln Ile Ala Arg Val Thr Asp
 70 75 80 85
 cta gga gtg ctt gtc gac gcc gac acc ggc ttt ggc gaa ccc atg tcg 403
 Leu Gly Val Leu Val Asp Ala Asp Thr Gly Phe Gly Glu Pro Met Ser
 90 95 100
 gcc gca cgc acc gtc gcc gaa ttg gag gac gcc ggt gtg gcc gga tgc 451
 Ala Ala Arg Thr Val Ala Glu Leu Glu Asp Ala Gly Val Ala Gly Cys
 105 110 115
 cac ctt gaa gac caa gtc aac ccc aaa cgt tgc ggc cac ttg gac ggc 499
 His Leu Glu Asp Gln Val Asn Pro Lys Arg Cys Gly His Leu Asp Gly
 120 125 130
 aaa gaa gtc gtg cgc aca gac gtg atg gtt cga cgc atc gca gcc gcc 547
 Lys Glu Val Val Arg Thr Asp Val Met Val Arg Arg Ile Ala Ala Ala
 135 140 145

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 Val Ser Ala Arg Arg Asp Pro Asn Phe Val Ile Cys Ala Arg Thr Asp
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 gcc gct gga gtg gaa gga atc gac gcc gcc att gag cgc gcg aaa gcc 643
 Ala Ala Gly Val Glu Gly Ile Asp Ala Ala Ile Glu Arg Ala Lys Ala
 170 175 180

 tac tta gat gcg ggc gcc gac atg att ttc acc gaa gcc ctc cac agc 691
 Tyr Leu Asp Ala Gly Ala Asp Met Ile Phe Thr Glu Ala Leu His Ser
 185 190 195

 gaa gcc gac ttc cga tac ttc cgg cac gcc atc cct gat gcc ttg ttg 739
 Glu Ala Asp Phe Arg Tyr Phe Arg His Ala Ile Pro Asp Ala Leu Leu
 200 205 210

 ctg gcg aat atg acc gaa ttt ggc aaa acg acg ctg ctg tca gcc gac 787
 Leu Ala Asn Met Thr Glu Phe Gly Lys Thr Thr Leu Leu Ser Ala Asp
 215 220 225

 gtg ttg gaa gag att ggc tac aac gcc gtg atc tac ccc gtg acc acg 835
 Val Leu Glu Glu Ile Gly Tyr Asn Ala Val Ile Tyr Pro Val Thr Thr
 230 235 240 245

 ctg cgt att gcc atg gga caa gta gaa caa gca cta gcc gaa atc aaa 883
 Leu Arg Ile Ala Met Gly Gln Val Glu Gln Ala Leu Ala Glu Ile Lys
 250 255 260

 gaa cac ggt acc caa gaa gga tgg ctg gac cgc atg caa cac cgc agc 931
 Glu His Gly Thr Gln Glu Gly Trp Leu Asp Arg Met Gln His Arg Ser
 265 270 275

 aga tta tat gag ctc ctg cga tac gaa gac tac aac gtc ttt gac cag 979
 Arg Leu Tyr Glu Leu Leu Arg Tyr Glu Asp Tyr Asn Val Phe Asp Gln
 280 285 290

 cac att ttc acc tac aga aaa gga gaa aac aat gag tgacagccaa 1025
 His Ile Phe Thr Tyr Arg Lys Gly Glu Asn Asn Glu
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 gtccgcaaag gac 1038

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<211> 305

<212> PRT

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Phe Lys Ala Ala Leu Ala Ala Pro His Ile Ala Arg Leu Pro Gly Ala
 20 25 30

Phe Ser Pro Leu Ile Ala Arg Ser Ile Glu Glu Ala Gly Phe Glu Gly
 35 40 45

Val Tyr Val Ser Gly Ala Val Ile Ala Ala Asp Leu Ala Leu Pro Asp
 50 55 60

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Ile Gly Leu Thr Thr Leu Thr Glu Val Ala His Arg Ala Arg Gln Ile
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Ala Arg Val Thr Asp Leu Gly Val Leu Val Asp Ala Asp Thr Gly Phe
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Gly Glu Pro Met Ser Ala Ala Arg Thr Val Ala Glu Leu Glu Asp Ala
          100                               105                               110

Gly Val Ala Gly Cys His Leu Glu Asp Gln Val Asn Pro Lys Arg Cys
          115                               120                               125

Gly His Leu Asp Gly Lys Glu Val Val Arg Thr Asp Val Met Val Arg
          130                               135                               140

Arg Ile Ala Ala Ala Val Ser Ala Arg Arg Asp Pro Asn Phe Val Ile
          145                               150                               155                               160

Cys Ala Arg Thr Asp Ala Ala Gly Val Glu Gly Ile Asp Ala Ala Ile
          165                               170                               175

Glu Arg Ala Lys Ala Tyr Leu Asp Ala Gly Ala Asp Met Ile Phe Thr
          180                               185                               190

Glu Ala Leu His Ser Glu Ala Asp Phe Arg Tyr Phe Arg His Ala Ile
          195                               200                               205

Pro Asp Ala Leu Leu Leu Ala Asn Met Thr Glu Phe Gly Lys Thr Thr
          210                               215                               220

Leu Leu Ser Ala Asp Val Leu Glu Glu Ile Gly Tyr Asn Ala Val Ile
          225                               230                               235                               240

Tyr Pro Val Thr Thr Leu Arg Ile Ala Met Gly Gln Val Glu Gln Ala
          245                               250                               255

Leu Ala Glu Ile Lys Glu His Gly Thr Gln Glu Gly Trp Leu Asp Arg
          260                               265                               270

Met Gln His Arg Ser Arg Leu Tyr Glu Leu Leu Arg Tyr Glu Asp Tyr
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Asn Val Phe Asp Gln His Ile Phe Thr Tyr Arg Lys Gly Glu Asn Asn
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Glu
305

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 1           5           10           15

gcc atg gga caa gta gaa caa gca cta gcc gaa atc aaa gaa cac ggt 96
Ala Met Gly Gln Val Glu Gln Ala Leu Ala Glu Ile Lys Glu His Gly
          20           25           30

acc caa gaa gga tgg ctg gac cgc atg caa cac cgc agc aga tta tat 144
Thr Gln Glu Gly Trp Leu Asp Arg Met Gln His Arg Ser Arg Leu Tyr
          35           40           45

gag ctc ctg cga tac gaa gac tac aac gtc ttt gac cag cac att ttc 192
Glu Leu Leu Arg Tyr Glu Asp Tyr Asn Val Phe Asp Gln His Ile Phe
 50           55           60

acc tac aga aaa gga gaa aac aat gag tgacagccaa gtccgcaaag 239
Thr Tyr Arg Lys Gly Glu Asn Asn Glu
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gac 242

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Ala Met Gly Gln Val Glu Gln Ala Leu Ala Glu Ile Lys Glu His Gly
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Thr Gln Glu Gly Trp Leu Asp Arg Met Gln His Arg Ser Arg Leu Tyr
          35           40           45

Glu Leu Leu Arg Tyr Glu Asp Tyr Asn Val Phe Asp Gln His Ile Phe
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Thr Tyr Arg Lys Gly Glu Asn Asn Glu
 65           70

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<213> Corynebacterium glutamicum

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<220>
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ctctctgcac aatgtttctt tcggaactat tctggcgacc atg cga att gaa atc 115
Met Arg Ile Glu Ile
          1           5

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002290"0420960

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Asp Gly Ile Asp Leu Ser Ser Val Ser Val Ser Met Thr Met Asn Gly	
150 155 160 165	
gct gtg ctg ccg att ctt gcg ttc tat atc gtg gcg gct gag gaa caa	643
Ala Val Leu Pro Ile Leu Ala Phe Tyr Ile Val Ala Ala Glu Glu Gln	
170 175 180	
ggc gtg ggt ccg gag cag ctt gcg ggc acg atc cag aat gac atc ttg	691
Gly Val Gly Pro Glu Gln Leu Ala Gly Thr Ile Gln Asn Asp Ile Leu	
185 190 195	
aaa gaa ttt atg gtg cgc aac acc tat att tat ccg ccg aag ccg tcg	739
Lys Glu Phe Met Val Arg Asn Thr Tyr Ile Tyr Pro Pro Lys Pro Ser	
200 205 210	
atg cgc atc att tcc aac atc ttt gag tac acc tcc ttg aag atg cca	787
Met Arg Ile Ile Ser Asn Ile Phe Glu Tyr Thr Ser Leu Lys Met Pro	
215 220 225	
cgt ttt aac tcc att tcg att tct ggc tat cac atc cag gaa gcg gga	835
Arg Phe Asn Ser Ile Ser Ile Ser Gly Tyr His Ile Gln Glu Ala Gly	
230 235 240 245	
gcg act gcc gat ttg gag ctg gcc tac act ctg gcg gat ggt att gaa	883
Ala Thr Ala Asp Leu Glu Leu Ala Tyr Thr Leu Ala Asp Gly Ile Glu	
250 255 260	
tac atc cgt gca ggt aaa gag gta ggc ctt gac gtg gat aag ttc gcg	931
Tyr Ile Arg Ala Gly Lys Glu Val Gly Leu Asp Val Asp Lys Phe Ala	
265 270 275	
cct cgt ctg tcc ttc ttc tgg ggt att tct atg tac acc ttc atg gag	979
Pro Arg Leu Ser Phe Phe Trp Gly Ile Ser Met Tyr Thr Phe Met Glu	
280 285 290	
atc gca aag ctg cgt gcg gga cga ctg ctg tgg agc gag ttg gtg gca	1027
Ile Ala Lys Leu Arg Ala Gly Arg Leu Leu Trp Ser Glu Leu Val Ala	
295 300 305	
aaa ttc gat ccg aaa aac gcc aag tcc cag tcg ctg cgc acg cac tcg	1075
Lys Phe Asp Pro Lys Asn Ala Lys Ser Gln Ser Leu Arg Thr His Ser	
310 315 320 325	
cag acc tct ggt tgg tcg ttg acc gcg cag gat gtg tac aac aac gtc	1123
Gln Thr Ser Gly Trp Ser Leu Thr Ala Gln Asp Val Tyr Asn Asn Val	
330 335 340	
gcc cgc acc gcg att gag gcg atg gct gca acc cag ggc cac acc cag	1171
Ala Arg Thr Ala Ile Glu Ala Met Ala Ala Thr Gln Gly His Thr Gln	
345 350 355	
tcg ctg cac acc aat gca ctt gat gag gcg ttg gcg ctg ccc acc gat	1219
Ser Leu His Thr Asn Ala Leu Asp Glu Ala Leu Ala Leu Pro Thr Asp	
360 365 370	
ttc tct gct cgt atc gcc cga aac acc cag ctg ttg ctg cag cag gaa	1267
Phe Ser Ala Arg Ile Ala Arg Asn Thr Gln Leu Leu Gln Gln Glu	
375 380 385	

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Asp Val Gly Pro Leu Phe Gln Thr Pro Ala Glu Ala Ala Arg Ala Ala
 630 635 640 645
 gtg gac gcc gat gtt cac gtg gtg ggt atg tct tcg ctg gca gca ggc 2083
 Val Asp Ala Asp Val His Val Val Gly Met Ser Ser Leu Ala Ala Gly
 650 655 660
 cac ctc acc ttg ctg ccc gag ctg aag aaa gaa ctt gca gct ctt ggc 2131
 His Leu Thr Leu Leu Pro Glu Leu Lys Lys Glu Leu Ala Ala Leu Gly
 665 670 675
 cgc gat gac att ctg gtc acc gtg ggc ggc gtc att ccg ccg ggc gat 2179
 Arg Asp Asp Ile Leu Val Thr Val Gly Gly Val Ile Pro Pro Gly Asp
 680 685 690
 ttc cag gat ctc tac gat atg ggt gcc gcc gcg att tac cct tca gga 2227
 Phe Gln Asp Leu Tyr Asp Met Gly Ala Ala Ala Ile Tyr Pro Ser Gly
 695 700 705
 acc gtc atc gcg gag tcg gcg atc gat ctg atc acc cga ctc gcc gca 2275
 Thr Val Ile Ala Glu Ser Ala Ile Asp Leu Ile Thr Arg Leu Ala Ala
 710 715 720 725
 cac ctg ggc ttt gac ctg gat gtg gat gtg aat gaa tgatcacggt 2321
 His Leu Gly Phe Asp Leu Asp Val Asp Val Asn Glu
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 ttcctagaag aca 2334

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 <212> PRT
 <213> Corynebacterium glutamicum

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 Pro Glu Gly Ile Asp Val Lys Arg Val Phe Thr Gln Ala Asp Arg Asp
 35 40 45
 Glu Ala Gln Ala Ala Gly His Pro Val Asp Ser Leu Pro Gly Gln Lys
 50 55 60
 Pro Phe Met Arg Gly Pro Tyr Pro Thr Met Tyr Thr Asn Gln Pro Trp
 65 70 75 80
 Thr Ile Arg Gln Tyr Ala Gly Phe Ser Thr Ala Ala Glu Ser Asn Ala
 85 90 95
 Phe Tyr Arg Arg Asn Leu Ala Ala Gly Gln Lys Gly Leu Ser Val Ala
 100 105 110
 Phe Asp Leu Ala Thr His Arg Gly Tyr Asp Ser Asp Asn Glu Arg Val
 115 120 125
 Val Gly Asp Val Gly Met Ala Gly Val Ala Ile Asp Ser Ile Leu Asp

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Ala	Ala	Glu	Glu	Gln	Gly	Val	Gly	Pro	Glu	Gln	Leu	Ala	Gly	Thr	Ile
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Gln	Asn	Asp	Ile	Leu	Lys	Glu	Phe	Met	Val	Arg	Asn	Thr	Tyr	Ile	Tyr
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Pro	Pro	Lys	Pro	Ser	Met	Arg	Ile	Ile	Ser	Asn	Ile	Phe	Glu	Tyr	Thr
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Ser	Leu	Lys	Met	Pro	Arg	Phe	Asn	Ser	Ile	Ser	Ile	Ser	Gly	Tyr	His
225					230					235					240
Ile	Gln	Glu	Ala	Gly	Ala	Thr	Ala	Asp	Leu	Glu	Leu	Ala	Tyr	Thr	Leu
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Ala	Asp	Gly	Ile	Glu	Tyr	Ile	Arg	Ala	Gly	Lys	Glu	Val	Gly	Leu	Asp
			260					265					270		
Val	Asp	Lys	Phe	Ala	Pro	Arg	Leu	Ser	Phe	Phe	Trp	Gly	Ile	Ser	Met
		275					280					285			
Tyr	Thr	Phe	Met	Glu	Ile	Ala	Lys	Leu	Arg	Ala	Gly	Arg	Leu	Leu	Trp
	290					295					300				
Ser	Glu	Leu	Val	Ala	Lys	Phe	Asp	Pro	Lys	Asn	Ala	Lys	Ser	Gln	Ser
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Leu	Arg	Thr	His	Ser	Gln	Thr	Ser	Gly	Trp	Ser	Leu	Thr	Ala	Gln	Asp
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Val	Tyr	Asn	Asn	Val	Ala	Arg	Thr	Ala	Ile	Glu	Ala	Met	Ala	Ala	Thr
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Gln	Gly	His	Thr	Gln	Ser	Leu	His	Thr	Asn	Ala	Leu	Asp	Glu	Ala	Leu
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Ala	Leu	Pro	Thr	Asp	Phe	Ser	Ala	Arg	Ile	Ala	Arg	Asn	Thr	Gln	Leu
	370					375					380				
Leu	Leu	Gln	Gln	Glu	Ser	Gly	Thr	Val	Arg	Pro	Val	Asp	Pro	Trp	Ala
385					390					395					400
Gly	Ser	Tyr	Tyr	Val	Glu	Trp	Leu	Thr	Asn	Glu	Leu	Ala	Asn	Arg	Ala
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Arg	Lys	His	Ile	Asp	Glu	Val	Glu	Glu	Ala	Gly	Gly	Met	Ala	Gln	Ala
			420					425					430		
Thr	Ala	Gln	Gly	Ile	Pro	Lys	Leu	Arg	Ile	Glu	Glu	Ser	Ala	Ala	Arg
		435					440					445			
Thr	Gln	Ala	Arg	Ile	Asp	Ser	Gly	Arg	Gln	Ala	Leu	Ile	Gly	Val	Asn
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Arg Tyr Val Ala Glu Glu Asp Glu Glu Ile Glu Val Leu Lys Val Asp
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 Asn Thr Lys Val Arg Ala Glu Gln Leu Ala Lys Leu Ala Gln Leu Lys
 485 490 495
 Ala Glu Arg Asn Asp Ala Glu Val Lys Ala Ala Leu Asp Ala Leu Thr
 500 505 510
 Ala Ala Ala Arg Asn Glu His Lys Glu Pro Gly Asp Leu Asp Gln Asn
 515 520 525
 Leu Leu Lys Leu Ala Val Asp Ala Ala Arg Ala Lys Ala Thr Ile Gly
 530 535 540
 Glu Ile Ser Asp Ala Leu Glu Val Val Phe Gly Arg His Glu Ala Glu
 545 550 555 560
 Ile Arg Thr Leu Ser Gly Val Tyr Lys Asp Glu Val Gly Lys Glu Gly
 565 570 575
 Thr Val Ser Asn Val Glu Arg Ala Ile Ala Leu Ala Asp Ala Phe Glu
 580 585 590
 Ala Glu Glu Gly Arg Arg Pro Arg Ile Phe Ile Ala Lys Met Gly Gln
 595 600 605
 Asp Gly His Asp Arg Gly Gln Lys Val Val Ala Ser Ala Tyr Ala Asp
 610 615 620
 Leu Gly Met Asp Val Asp Val Gly Pro Leu Phe Gln Thr Pro Ala Glu
 625 630 635 640
 Ala Ala Arg Ala Ala Val Asp Ala Asp Val His Val Val Gly Met Ser
 645 650 655
 Ser Leu Ala Ala Gly His Leu Thr Leu Leu Pro Glu Leu Lys Lys Glu
 660 665 670
 Leu Ala Ala Leu Gly Arg Asp Asp Ile Leu Val Thr Val Gly Gly Val
 675 680 685
 Ile Pro Pro Gly Asp Phe Gln Asp Leu Tyr Asp Met Gly Ala Ala Ala
 690 695 700
 Ile Tyr Pro Ser Gly Thr Val Ile Ala Glu Ser Ala Ile Asp Leu Ile
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 725 730 735
 Glu

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<211> 2098

<212> DNA

<213> Corynebacterium glutamicum

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<222> (101)..(2098)

<223> FRXA00148

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Met Thr Ser Ile Pro
1 5

aat ttt tca gac atc cca ttg act gct gag aca cgt gca tcg gag tca 163
Asn Phe Ser Asp Ile Pro Leu Thr Ala Glu Thr Arg Ala Ser Glu Ser
10 15 20

cac aac gtt gac gcc ggc aag gtg tgg aac act ccc gaa ggc att gat 211
His Asn Val Asp Ala Gly Lys Val Trp Asn Thr Pro Glu Gly Ile Asp
25 30 35

gtc aag cgc gta ttc acg cag gct gac cgc gac gag gcg caa gcg gcg 259
Val Lys Arg Val Phe Thr Gln Ala Asp Arg Asp Glu Ala Gln Ala Ala
40 45 50

gga cat ccg gtg gat tct ttg cca ggt caa aag cca ttt atg cgc ggg 307
Gly His Pro Val Asp Ser Leu Pro Gly Gln Lys Pro Phe Met Arg Gly
55 60 65

ccg tac cca act atg tac acc aat cag ccg tgg acg att cgc cag tac 355
Pro Tyr Pro Thr Met Tyr Thr Asn Gln Pro Trp Thr Ile Arg Gln Tyr
70 75 80 85

gca ggc ttt tca acc gcc gcg gaa tcc aat gcg ttt tat cgg agg aac 403
Ala Gly Phe Ser Thr Ala Ala Glu Ser Asn Ala Phe Tyr Arg Arg Asn
90 95 100

ctt gct gcg ggt caa aaa ggt ttg tcg gtt gcg ttc gat cta gcg acc 451
Leu Ala Ala Gly Gln Lys Gly Leu Ser Val Ala Phe Asp Leu Ala Thr
105 110 115

cac cgc ggt tat gac tcg gat aat gag cgc gtg gtc ggc gat gtg ggt 499
His Arg Gly Tyr Asp Ser Asp Asn Glu Arg Val Val Gly Asp Val Gly
120 125 130

atg gcc ggc gtg gcg att gat tcg att ttg gat atg cgt cag ctg ttt 547
Met Ala Gly Val Ala Ile Asp Ser Ile Leu Asp Met Arg Gln Leu Phe
135 140 145

gat ggc att gat ttg tcc agc gtg tcg gtg tcg atg acc atg aat ggc 595
Asp Gly Ile Asp Leu Ser Ser Val Ser Val Ser Met Thr Met Asn Gly
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gct gtg ctg ccg att ctt gcg ttc tat atc gtg gcg gct gag gaa caa 643
Ala Val Leu Pro Ile Leu Ala Phe Tyr Ile Val Ala Ala Glu Glu Gln
170 175 180

ggg gtg ggt ccg gag cag ctt gcg ggc acg atc cag aat gac atc ttg 691
Gly Val Gly Pro Glu Gln Leu Ala Gly Thr Ile Gln Asn Asp Ile Leu
185 190 195

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09602740-062300

<212> PRT

<213> *Corynebacterium glutamicum*

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Pro Glu Gly Ile Asp Val Lys Arg Val Phe Thr Gln Ala Asp Arg Asp
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Glu Ala Gln Ala Ala Gly His Pro Val Asp Ser Leu Pro Gly Gln Lys
 50           55           60

Pro Phe Met Arg Gly Pro Tyr Pro Thr Met Tyr Thr Asn Gln Pro Trp
 65           70           75           80

Thr Ile Arg Gln Tyr Ala Gly Phe Ser Thr Ala Ala Glu Ser Asn Ala
          85           90           95

Phe Tyr Arg Arg Asn Leu Ala Ala Gly Gln Lys Gly Leu Ser Val Ala
          100          105          110

Phe Asp Leu Ala Thr His Arg Gly Tyr Asp Ser Asp Asn Glu Arg Val
          115          120          125

Val Gly Asp Val Gly Met Ala Gly Val Ala Ile Asp Ser Ile Leu Asp
          130          135          140

Met Arg Gln Leu Phe Asp Gly Ile Asp Leu Ser Ser Val Ser Val Ser
          145          150          155          160

Met Thr Met Asn Gly Ala Val Leu Pro Ile Leu Ala Phe Tyr Ile Val
          165          170          175

Ala Ala Glu Glu Gln Gly Val Gly Pro Glu Gln Leu Ala Gly Thr Ile
          180          185          190

Gln Asn Asp Ile Leu Lys Glu Phe Met Val Arg Asn Thr Tyr Ile Tyr
          195          200          205

Pro Pro Lys Pro Ser Met Arg Ile Ile Ser Asn Ile Phe Glu Tyr Thr
          210          215          220

Ser Leu Lys Met Pro Arg Phe Asn Ser Ile Ser Ile Ser Gly Tyr His
          225          230          235          240

Ile Gln Glu Ala Gly Ala Thr Ala Asp Leu Glu Leu Ala Tyr Thr Leu
          245          250          255

Ala Asp Gly Ile Glu Tyr Ile Arg Ala Gly Lys Glu Val Gly Leu Asp
          260          265          270

Val Asp Lys Phe Ala Pro Arg Leu Ser Phe Phe Trp Gly Ile Ser Met
          275          280          285

Tyr Thr Phe Met Glu Ile Ala Lys Leu Arg Ala Gly Arg Leu Leu Trp
          290          295          300

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09602740 062300

Ser Glu Leu Val Ala Lys Phe Asp Pro Lys Asn Ala Lys Ser Gln Ser
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 Leu Arg Thr His Ser Gln Thr Ser Gly Trp Ser Leu Thr Ala Gln Asp
 325 330 335
 Val Tyr Asn Asn Val Ala Arg Thr Ala Ile Glu Ala Met Ala Ala Thr
 340 345 350
 Gln Gly His Thr Gln Ser Leu His Thr Asn Ala Leu Asp Glu Ala Leu
 355 360 365
 Ala Leu Pro Thr Asp Phe Ser Ala Arg Ile Ala Arg Asn Thr Gln Leu
 370 375 380
 Leu Leu Gln Gln Glu Ser Gly Thr Val Arg Pro Val Asp Pro Trp Ala
 385 390 395 400
 Gly Ser Tyr Tyr Val Glu Trp Leu Thr Asn Glu Leu Ala Asn Arg Ala
 405 410 415
 Arg Lys His Ile Asp Glu Val Glu Glu Ala Gly Gly Met Ala Gln Ala
 420 425 430
 Thr Ala Gln Gly Ile Pro Lys Leu Arg Ile Glu Glu Ser Ala Ala Arg
 435 440 445
 Thr Gln Ala Arg Ile Asp Ser Gly Arg Gln Ala Leu Ile Gly Val Asn
 450 455 460
 Arg Tyr Val Ala Glu Glu Asp Glu Glu Ile Glu Val Leu Lys Val Asp
 465 470 475 480
 Asn Thr Lys Val Arg Ala Glu Gln Leu Ala Lys Leu Ala Gln Leu Lys
 485 490 495
 Ala Glu Arg Asn Asp Ala Glu Val Lys Ala Ala Leu Asp Ala Leu Thr
 500 505 510
 Ala Ala Ala Arg Asn Glu His Lys Glu Pro Gly Asp Leu Asp Gln Asn
 515 520 525
 Leu Leu Lys Leu Ala Val Asp Ala Ala Arg Ala Lys Ala Thr Ile Gly
 530 535 540
 Glu Ile Ser Asp Ala Leu Glu Val Val Phe Gly Arg His Glu Ala Glu
 545 550 555 560
 Ile Arg Thr Leu Ser Gly Val Tyr Lys Asp Glu Val Gly Lys Glu Gly
 565 570 575
 Thr Val Ser Asn Val Glu Arg Ala Ile Ala Leu Ala Asp Ala Phe Glu
 580 585 590
 Ala Glu Glu Gly Arg Arg Pro Arg Ile Phe Ile Ala Lys Met Gly Gln
 595 600 605
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 Leu Gly Met Asp Val Asp Val Gly Pro Leu Phe Gln Thr Pro Ala Glu

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										Leu	Thr	Asp	Leu	Thr	5		
										1							
aag	act	gcg	gtg	ccc	gag	gaa	ctt	tca	gag	aac	ctc	gaa	act	tgg	tac	163	
Lys	Thr	Ala	Val	Pro	Glu	Glu	Leu	Ser	Glu	Asn	Leu	Glu	Thr	Trp	Tyr		
				10					15								
aag	gct	gtg	gcc	ggg	gtt	ttc	gcg	cg	aca	cag	aaa	aaa	gac	atc	ggc	211	
Lys	Ala	Val	Ala	Gly	Val	Phe	Ala	Arg	Thr	Gln	Lys	Lys	Asp	Ile	Gly		
				25					30								
gac	att	gcc	gta	gat	gtg	tgg	aag	aaa	ctc	atc	gtc	act	aca	ccg	gat	259	
Asp	Ile	Ala	Val	Asp	Val	Trp	Lys	Lys	Leu	Ile	Val	Thr	Thr	Pro	Asp		
		40					45					50					
ggg	gtt	gat	atc	aat	ccg	ctg	tac	acc	aga	gca	gat	gag	tcc	cag	agg	307	
Gly	Val	Asp	Ile	Asn	Pro	Leu	Tyr	Thr	Arg	Ala	Asp	Glu	Ser	Gln	Arg		
		55					60					65					
aaa	ttc	act	gag	gtt	cct	ggg	gag	ttt	ccc	ttc	act	agg	gga	acc	act	355	
Lys	Phe	Thr	Glu	Val	Pro	Gly	Glu	Phe	Pro	Phe	Thr	Arg	Gly	Thr	Thr		
70					75					80					85		
gtt	gat	ggg	gaa	cg	gtt	ggg	tgg	ggg	gtt	act	gag	act	ttc	gga	cat	403	
Val	Asp	Gly	Glu	Arg	Val	Gly	Trp	Gly	Val	Thr	Glu	Thr	Phe	Gly	His		
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gac	agc	ccg	aag	aat	atc	aac	gct	gcg	gtg	ctg	aat	gct	ctg	aat	tct	451	
Asp	Ser	Pro	Lys	Asn	Ile	Asn	Ala	Ala	Val	Leu	Asn	Ala	Leu	Asn	Ser		
			105					110					115				
ggc	acc	acc	aca	ttg	ggg	ttt	gag	ttc	tct	gag	gaa	ttc	acg	gca	gct	499	
Gly	Thr	Thr	Thr	Leu	Gly	Phe	Glu	Phe	Ser	Glu	Glu	Phe	Thr	Ala	Ala		
		120					125					130					
gat	ctt	aaa	gtt	gct	ctc	gaa	ggc	gtg	tat	ctc	aac	atg	gct	ccg	ttg	547	
Asp	Leu	Lys	Val	Ala	Leu	Glu	Gly	Val	Tyr	Leu	Asn	Met	Ala	Pro	Leu		
		135					140					145					

SECRET

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Thr Leu Ala Glu Ala Gly Thr Phe Phe Ala Ala Leu Thr Leu Gly	
170 175 180	
tct cgt cct ttg acg gcg cag gtt gat ggt tcg cac agt gac acc att	691
Ser Arg Pro Leu Thr Ala Gln Val Asp Gly Ser His Ser Asp Thr Ile	
185 190 195	
gaa gaa gca gtt cag ttg gca gtg aat gct tcc aag cgt gcg aat gtg	739
Glu Glu Ala Val Gln Leu Ala Val Asn Ala Ser Lys Arg Ala Asn Val	
200 205 210	
cgc gct atc ttg gtg gat ggt tcc agt ttt tcc aac cag ggc gcg tcg	787
Arg Ala Ile Leu Val Asp Gly Ser Ser Phe Ser Asn Gln Gly Ala Ser	
215 220 225	
gat gct caa gaa att ggt cta agt atc gcc gcc ggt gtg gat tat gtc	835
Asp Ala Gln Glu Ile Gly Leu Ser Ile Ala Ala Gly Val Asp Tyr Val	
230 235 240 245	
cgt cgc ttg gtc gat gca ggc ctt tcc acg gaa gct gca ctt aag cag	883
Arg Arg Leu Val Asp Ala Gly Leu Ser Thr Glu Ala Ala Leu Lys Gln	
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Val Ala Phe Arg Phe Ala Val Thr Asp Glu Gln Phe Ala Gln Ile Ser	
265 270 275	
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Lys Leu Arg Val Ala Arg Arg Leu Trp Ala Arg Val Cys Glu Val Leu	
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Gly Phe Pro Glu Leu Ala Val Ala Pro Gln His Ala Val Thr Ala Arg	
295 300 305	
gcg atg ttt agc cag cgt gat ccg tgg gtg aat atg ctg cgc agt act	1075
Ala Met Phe Ser Gln Arg Asp Pro Trp Val Asn Met Leu Arg Ser Thr	
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gtt gca gct ttc gct gca ggc gtc ggt gga gca acc gat gtg gag gtt	1123
Val Ala Ala Phe Ala Ala Gly Val Gly Gly Ala Thr Asp Val Glu Val	
330 335 340	
cgt act ttt gat gat gcg atc cca gat gga gtt cct gga gtg tcg agg	1171
Arg Thr Phe Asp Asp Ala Ile Pro Asp Gly Val Pro Gly Ser Arg	
345 350 355	
aat ttc gct cac cgc atc gcg cgc aat act aat ttg ttg ttg cta gaa	1219
Asn Phe Ala His Arg Ile Ala Arg Asn Thr Asn Leu Leu Leu Leu Glu	
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gag tca cat ctt ggt cac gtg gtt gat cct gct ggt gga tca tat ttc	1267
Glu Ser His Leu Gly His Val Val Asp Pro Ala Gly Gly Ser Tyr Phe	
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gtg gag agc ttc acc gat gat cta gcg gag aag gcg tgg gct gtg ttc 1315
 Val Glu Ser Phe Thr Asp Asp Leu Ala Glu Lys Ala Trp Ala Val Phe
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agt ggc atc gaa gct gag ggc gga tac agt gca gct tgt gca tcc ggc 1363
 Ser Gly Ile Glu Ala Glu Gly Gly Tyr Ser Ala Ala Cys Ala Ser Gly
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 Thr Val Thr Ala Met Leu Asp Gln Thr Trp Glu Gln Thr Arg Ala Asp
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 455 460 465

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 Val Arg Arg Trp Ala Ala Asp Phe Glu Ala Leu Arg Asn Arg Ser Asp
 470 475 480 485

gct ttc ttg gaa aag aac ggc gcg agg cca cag atc acg atg att cct 1603
 Ala Phe Leu Glu Lys Asn Gly Ala Arg Pro Gln Ile Thr Met Ile Pro
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 Leu Leu Ala Ser Gly Gly Ile Glu Ala Ile Asn Pro Gly Gln Leu Val
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ccc ggc act gac gct ttt gca gaa gct gca cag gcc gca ggc att gta 1747
 Pro Gly Thr Asp Ala Phe Ala Glu Ala Ala Gln Ala Ala Gly Ile Val
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gtg gtg tgt gga acg gac caa gag tat gcc gaa acg ggg gag gga gcc 1795
 Val Val Cys Gly Thr Asp Gln Glu Tyr Ala Glu Thr Gly Glu Gly Ala
 550 555 560 565

gtc gaa aag ctc cgc gaa gcg ggc gtt gag cgc atc ctg ctt gct ggc 1843
 Val Glu Lys Leu Arg Glu Ala Gly Val Glu Arg Ile Leu Leu Ala Gly
 570 575 580

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 Ala Pro Lys Ser Phe Glu Gly Ser Ala His Ala Pro Asp Gly Tyr Leu
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 Asn Met Thr Ile Asp Ala Ala Ala Thr Leu Ala Asp Leu Leu Asp Ala
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09602740-062300

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 35 40 45

Val Thr Thr Pro Asp Gly Val Asp Ile Asn Pro Leu Tyr Thr Arg Ala
 50 55 60

Asp Glu Ser Gln Arg Lys Phe Thr Glu Val Pro Gly Glu Phe Pro Phe
 65 70 75 80

Thr Arg Gly Thr Thr Val Asp Gly Glu Arg Val Gly Trp Gly Val Thr
 85 90 95

Glu Thr Phe Gly His Asp Ser Pro Lys Asn Ile Asn Ala Ala Val Leu
 100 105 110

Asn Ala Leu Asn Ser Gly Thr Thr Thr Leu Gly Phe Glu Phe Ser Glu
 115 120 125

Glu Phe Thr Ala Ala Asp Leu Lys Val Ala Leu Glu Gly Val Tyr Leu
 130 135 140

Asn Met Ala Pro Leu Leu Ile His Ala Gly Gly Ser Thr Ser Glu Val
 145 150 155 160

Ala Ala Ala Leu Tyr Thr Leu Ala Glu Glu Ala Gly Thr Phe Phe Ala
 165 170 175

Ala Leu Thr Leu Gly Ser Arg Pro Leu Thr Ala Gln Val Asp Gly Ser
 180 185 190

His Ser Asp Thr Ile Glu Glu Ala Val Gln Leu Ala Val Asn Ala Ser
 195 200 205

Lys Arg Ala Asn Val Arg Ala Ile Leu Val Asp Gly Ser Ser Phe Ser
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Asn Gln Gly Ala Ser Asp Ala Gln Glu Ile Gly Leu Ser Ile Ala Ala
 225 230 235 240

Gly Val Asp Tyr Val Arg Arg Leu Val Asp Ala Gly Leu Ser Thr Glu
 245 250 255

Ala Ala Leu Lys Gln Val Ala Phe Arg Phe Ala Val Thr Asp Glu Gln
 260 265 270

Phe Ala Gln Ile Ser Lys Leu Arg Val Ala Arg Arg Leu Trp Ala Arg
 275 280 285

Val Cys Glu Val Leu Gly Phe Pro Glu Leu Ala Val Ala Pro Gln His

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Pro Gly Val Ser Arg Asn Phe Ala His Arg Ile Ala Arg Asn Thr Asn 355 360 365		
Leu Leu Leu Leu Glu Glu Ser His Leu Gly His Val Val Asp Pro Ala 370 375 380		
Gly Gly Ser Tyr Phe Val Glu Ser Phe Thr Asp Asp Leu Ala Glu Lys 385 390 395 400		
Ala Trp Ala Val Phe Ser Gly Ile Glu Ala Glu Gly Gly Tyr Ser Ala 405 410 415		
Ala Cys Ala Ser Gly Thr Val Thr Ala Met Leu Asp Gln Thr Trp Glu 420 425 430		
Gln Thr Arg Ala Asp Val Ala Ser Arg Lys Lys Lys Leu Thr Gly Ile 435 440 445		
Asn Glu Phe Pro Asn Leu Ala Glu Ser Pro Leu Pro Ala Asp Arg Arg 450 455 460		
Val Glu Pro Ala Gly Val Arg Arg Trp Ala Ala Asp Phe Glu Ala Leu 465 470 475 480		
Arg Asn Arg Ser Asp Ala Phe Leu Glu Lys Asn Gly Ala Arg Pro Gln 485 490 495		
Ile Thr Met Ile Pro Leu Gly Pro Leu Ser Lys His Asn Ile Arg Thr 500 505 510		
Gly Phe Thr Ser Asn Leu Leu Ala Ser Gly Gly Ile Glu Ala Ile Asn 515 520 525		
Pro Gly Gln Leu Val Pro Gly Thr Asp Ala Phe Ala Glu Ala Ala Gln 530 535 540		
Ala Ala Gly Ile Val Val Val Cys Gly Thr Asp Gln Glu Tyr Ala Glu 545 550 555 560		
Thr Gly Glu Gly Ala Val Glu Lys Leu Arg Glu Ala Gly Val Glu Arg 565 570 575		
Ile Leu Leu Ala Gly Ala Pro Lys Ser Phe Glu Gly Ser Ala His Ala 580 585 590		
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gac	gct	gcc	cgc	tac	acc	gtg	agc	acc	gca	gaa	gaa	tta	gaa	agg	atc	739				
Asp	Ala	Ala	Arg	Tyr	Thr	Val	Ser	Thr	Ala	Glu	Glu	Leu	Glu	Arg	Ile					
		200					205					210								
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Ile	His	Asp	Trp	Ala																
		215																		

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His	Glu	Lys	Asn	Trp	Glu	Ile	Pro	Ser	Glu	Glu	Arg	Ile	Ser	Gln	Val	
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Pro	Gly	Pro	Pro	Met	Glu	Trp	Thr	Phe	Gln	Asp	Leu	Gly	Met	Thr	Pro	
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Glu	Gln	Ala	Gln	Asp	Ala	Leu	Gln	Thr	Tyr	Leu	Glu	His	Tyr	Gly	Gln	
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Val	Gly	Trp	Asp	Leu	Ser	Glu	Ala	Phe	Pro	Gly	Met	Arg	Asp	Leu	Leu	
				85					90					95		
Ile	Arg	Leu	Lys	Tyr	Glu	Gly	Phe	Arg	Leu	Cys	Thr	Ala	Thr	Ser	Lys	
			100					105					110			
Gly	Glu	Phe	Phe	Ala	Glu	Lys	Val	Leu	Arg	Lys	Phe	Glu	Met	Phe	Asp	
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Leu	Phe	Glu	Phe	Met	Gly	Ala	Ala	Thr	Asp	Ser	Gly	Asn	Arg	Arg	Ser	
	130					135					140					
Lys	Ser	Ala	Val	Ile	Lys	His	Val	Leu	Asp	Ser	Val	Gly	Leu	Asp	Glu	
145					150	?				155					160	
Pro	Asn	Asp	Ile	Leu	Met	Ile	Gly	Asp	Arg	Ser	His	Asp	Ile	Glu	Gly	
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Ser	Ser	Glu	Phe	Gly	Ile	Asp	Cys	Val	Ala	Val	Thr	Trp	Gly	Tyr	Gly	
			180					185					190			
Ser	Lys	Thr	Glu	Trp	Asp	Ala	Ala	Arg	Tyr	Thr	Val	Ser	Thr	Ala	Glu	
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09602740, 062300

Gly

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<222> (101)..(793)
<223> RXA02196
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Figure 1. Schematic representation of the experimental design. The subjects were divided into two groups: the control group (CG) and the experimental group (EG). The CG was divided into two subgroups: the control group (CG) and the control group (CG). The EG was divided into two subgroups: the experimental group (EG) and the experimental group (EG). The CG was divided into two subgroups: the control group (CG) and the control group (CG). The EG was divided into two subgroups: the experimental group (EG) and the experimental group (EG).

Ala Leu Glu Ile Pro Met Leu Val Thr Thr Asn Thr Glu Arg Asp Leu
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gcg acc cgt tca gtc gca gcc gtg gga aat gag ttc ttc atc ggt tct 499
Ala Thr Arg Ser Val Ala Ala Val Gly Asn Glu Phe Phe Ile Gly Ser
120 125 130

atc gct ggt gat gaa gtc cca aca gca aag cca gcc ccc gac atg tac 547
Ile Ala Gly Asp Glu Val Pro Thr Ala Lys Pro Ala Pro Asp Met Tyr
135 140 145

ctc gaa gca gca cga cgt gtg ggc ttt gac cca tca gag tgc ctc gtg 595
Leu Glu Ala Ala Arg Arg Val Gly Phe Asp Pro Ser Glu Cys Leu Val
150 155 160 165

ttc gaa gat tcc tac aac ggc atg ctg ggc gct gtt act gca ggt tgc 643
Phe Glu Asp Ser Tyr Asn Gly Met Leu Gly Ala Val Thr Ala Gly Cys
170 175 180

cgc gtc att ggt ctg cac cca gaa gaa gtc caa gcg cca gaa ggt gta 691
Arg Val Ile Gly Leu His Pro Glu Glu Val Gln Ala Pro Glu Gly Val
185 190 195

gtg cct ttg cgt tcc ctc cac ggt aaa aac tct ttc gaa ggt gtc acc 739
Val Pro Leu Arg Ser Leu His Gly Lys Asn Ser Phe Glu Gly Val Thr
200 205 210

gct gag atg gtc act gcc tgg tac cac cag atc gag ccg gca ggt gtc 787
Ala Glu Met Val Thr Ala Trp Tyr His Gln Ile Glu Pro Ala Gly Val
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Ala Lys
230

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20 25 30

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35 40 45

Pro Arg Thr Met Arg Leu Cys Ala Glu His Ala Gly Ile Thr Leu Ser
50 55 60

Asp Ala Asp Tyr Glu Arg Tyr Arg Ala Gly Met Phe Ala Arg Val His
65 70 75 80

Glu Leu Phe Asp Glu Ser Leu Val Pro Asn Pro Gly Val Thr Glu Leu
85 90 95

Leu Thr Glu Leu Lys Ala Leu Glu Ile Pro Met Leu Val Thr Thr Asn

09602740 062300

[illegible]

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 Ile Asp Leu Pro Met Arg Asp Cys Val Leu Val Asp Asp Ser Ile Leu
 90 95 100
 aac gtg cgc ggc gcc gtc gaa gcc gga ctc gta ggc gtc tac tac cag 451
 Asn Val Arg Gly Ala Val Glu Ala Gly Leu Val Gly Val Tyr Tyr Gln
 105 110 115
 caa ttt gac cgt gca gtc gtc gaa atc gtc gga ctg ttc ggg cta gaa 499
 Gln Phe Asp Arg Ala Val Val Glu Ile Val Gly Leu Phe Gly Leu Glu
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 gga gaa ttc taatcttgcg cgtctacatc cca 531
 Gly Glu Phe
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 35 40 45
 Ala Pro Ile Arg Glu Leu Glu Thr Asn Gly Val Val Asp Lys Val Leu
 50 55 60
 Leu Ser Gly Glu Leu Gly Val Glu Lys Pro Glu Glu Ala Ala Phe Gln
 65 70 75 80
 Ala Ala Ala Asp Ala Ile Asp Leu Pro Met Arg Asp Cys Val Leu Val
 85 90 95
 Asp Asp Ser Ile Leu Asn Val Arg Gly Ala Val Glu Ala Gly Leu Val
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 Gly Val Tyr Tyr Gln Gln Phe Asp Arg Ala Val Val Glu Ile Val Gly
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 Leu Phe Gly Leu Glu Gly Glu Phe
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002290" 04/20/96

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 215 220 225

gcg ttg tgg gtt ggt tgg tgg acc aca gtt gtc tct tcc gtg gcg ctg 835
 Ala Leu Trp Val Gly Trp Trp Thr Thr Val Val Ser Ser Val Ala Leu
 230 235 240 245

ttc atc act ggc gat atc cag gcg aag ctc atg ttc gtg caa cag cca 883
 Phe Ile Thr Gly Asp Ile Gln Ala Lys Leu Met Phe Val Gln Gln Pro
 250 255 260

atg aag atg gcg tcg gcg gaa tcc ttg tgt gaa acc gcc aca gat cca 931
 Met Lys Met Ala Ser Ala Glu Ser Leu Cys Glu Thr Ala Thr Asp Pro
 265 270 275

aac ttc tcc att ctg aca att ggt acg cac aac aac tgc gat acg gta 979
 Asn Phe Ser Ile Leu Thr Ile Gly Thr His Asn Asn Cys Asp Thr Val
 280 285 290

acc cac ctg atc gat gtt ccg ttt gtg ctt cca ttc ttg gct gaa gga 1027
 Thr His Leu Ile Asp Val Pro Phe Val Leu Pro Phe Leu Ala Glu Gly
 295 300 305

aaa ttc acc ggt gtg act ttg cag ggt gta aac cag ctc caa gct gca 1075
 Lys Phe Thr Gly Val Thr Leu Gln Gly Val Asn Gln Leu Gln Ala Ala
 310 315 320 325

gcg gag caa gca tac ggt cct ggc aac tac tcc cct aac ttg ttt gtc 1123
 Ala Glu Gln Ala Tyr Gly Pro Gly Asn Tyr Ser Pro Asn Leu Phe Val
 330 335 340

acc tac tgg tca ttc cgc gca atg atc ggc ctg atg ctt ggt tct ttg 1171
 Thr Tyr Trp Ser Phe Arg Ala Met Ile Gly Leu Met Leu Gly Ser Leu
 345 350 355

gct atc gct gcg att gcg tgg ctg ttg ctg cgt aag aag cgc aca cca 1219
 Ala Ile Ala Ala Ile Ala Trp Leu Leu Leu Arg Lys Lys Arg Thr Pro
 360 365 370

act gga aag att gct cgt ctg ttc cag atc ggc agc ctc att gct atc 1267
 Thr Gly Lys Ile Ala Arg Leu Phe Gln Ile Gly Ser Leu Ile Ala Ile
 375 380 385

ccg ttc cca ttc ttg gcc aac tct gct ggt tgg atc ttc acc gag atg 1315
 Pro Phe Pro Phe Leu Ala Asn Ser Ala Gly Trp Ile Phe Thr Glu Met
 390 395 400 405

ggc cgc cag cct tgg gtg gtg cac ccg aac cct gaa tct gcc ggc gat 1363
 Gly Arg Gln Pro Trp Val Val His Pro Asn Pro Glu Ser Ala Gly Asp
 410 415 420

gcc cga aca gag atg atc cgg atg act gtt gat atg ggt gta tct gat 1411
 Ala Arg Thr Glu Met Ile Arg Met Thr Val Asp Met Gly Val Ser Asp
 425 430 435

cat gcg cca tgg caa gtc tgg ctg act ctc att ggc ttc acg att ctc 1459
 His Ala Pro Trp Gln Val Trp Leu Thr Leu Ile Gly Phe Thr Ile Leu
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 Tyr Leu Ile Leu Phe Val Val Trp Val Trp Leu Ile Arg Arg Ala Val
 455 460 465

ctg atc gga cca cca gag gaa ggc gct cca tcc gtg gag gca aag act 1555
 Leu Ile Gly Pro Pro Glu Glu Gly Ala Pro Ser Val Glu Ala Lys Thr
 470 475 480 485

gga ccg gca acc ccg att ggt tca gat atg ccc atg aca ccg ctg caa 1603
 Gly Pro Ala Thr Pro Ile Gly Ser Asp Met Pro Met Thr Pro Leu Gln
 490 495 500

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<400> 642

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Ala Ile Met Gln Thr Phe Trp Gln Val Thr Gly Lys Glu His Trp Tyr
 35 40 45

Arg Ala Thr Arg Phe Phe Gly Thr Val Leu Leu Ile Asn Phe Ala Val
 50 55 60

Gly Val Ala Thr Gly Ile Val Gln Glu Phe Gln Phe Gly Met Asn Trp
 65 70 75 80

Ser Glu Tyr Ser Arg Phe Val Gly Asp Val Phe Gly Gly Pro Leu Ala
 85 90 95

Leu Glu Gly Leu Ile Ala Phe Phe Leu Glu Ser Val Phe Leu Gly Leu
 100 105 110

Trp Ile Phe Gly Trp Gly Lys Ile Pro Gly Trp Leu His Thr Ala Ser
 115 120 125

Ile Trp Ile Val Ala Ile Ala Thr Asn Ile Ser Ala Tyr Phe Ile Ile
 130 135 140

Val Ala Asn Ser Phe Met Gln His Pro Val Gly Ala Glu Tyr Asn Pro
 145 150 155 160

Glu Thr Gly Arg Ala Glu Leu Thr Asp Phe Trp Ala Leu Leu Thr Asn
 165 170 175

Ser Thr Ala Leu Ala Ala Phe Pro His Ala Val Ala Gly Gly Phe Leu
 180 185 190

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 210 215 220
 Ser Met His Arg Pro Ala Leu Trp Val Gly Trp Trp Thr Thr Val Val
 225 230 235 240
 Ser Ser Val Ala Leu Phe Ile Thr Gly Asp Ile Gln Ala Lys Leu Met
 245 250 255
 Phe Val Gln Gln Pro Met Lys Met Ala Ser Ala Glu Ser Leu Cys Glu
 260 265 270
 Thr Ala Thr Asp Pro Asn Phe Ser Ile Leu Thr Ile Gly Thr His Asn
 275 280 285
 Asn Cys Asp Thr Val Thr His Leu Ile Asp Val Pro Phe Val Leu Pro
 290 295 300
 Phe Leu Ala Glu Gly Lys Phe Thr Gly Val Thr Leu Gln Gly Val Asn
 305 310 315 320
 Gln Leu Gln Ala Ala Ala Glu Gln Ala Tyr Gly Pro Gly Asn Tyr Ser
 325 330 335
 Pro Asn Leu Phe Val Thr Tyr Trp Ser Phe Arg Ala Met Ile Gly Leu
 340 345 350
 Met Leu Gly Ser Leu Ala Ile Ala Ala Ile Ala Trp Leu Leu Leu Arg
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 Lys Lys Arg Thr Pro Thr Gly Lys Ile Ala Arg Leu Phe Gln Ile Gly
 370 375 380
 Ser Leu Ile Ala Ile Pro Phe Pro Phe Leu Ala Asn Ser Ala Gly Trp
 385 390 395 400
 Ile Phe Thr Glu Met Gly Arg Gln Pro Trp Val Val His Pro Asn Pro
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 420 425 430
 Met Gly Val Ser Asp His Ala Pro Trp Gln Val Trp Leu Thr Leu Ile
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 Gly Phe Thr Ile Leu Tyr Leu Ile Leu Phe Val Val Trp Val Trp Leu
 450 455 460
 Ile Arg Arg Ala Val Leu Ile Gly Pro Pro Glu Glu Gly Ala Pro Ser
 465 470 475 480
 Val Glu Ala Lys Thr Gly Pro Ala Thr Pro Ile Gly Ser Asp Met Pro
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00602740 062300

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							Val	Asp	Val	Val	Asp					
							1				5					
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Ile	Ala	Arg	Trp	Gln	Phe	Gly	Ile	Thr	Thr	Val	Tyr	His	Phe	Ile	Phe	
				10					15					20		
gtc	cca	ctg	acc	att	ggc	tta	gca	ccg	ctg	gtc	gcg	atc	atg	caa	acg	211
Val	Pro	Leu	Thr	Ile	Gly	Leu	Ala	Pro	Leu	Val	Ala	Ile	Met	Gln	Thr	
			25				30				35					
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Ala Ile Met Gln Thr Phe Trp Gln Val Thr Gly Lys Glu His
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gct	ttg	gag	ggt	ctt	atc	gcg	ttc	ttc	ctt	gag	tct	gta	ttc	ctg	gga	96
Ala	Leu	Glu	Gly 20	Leu	Ile	Ala	Phe	Phe 25	Leu	Glu	Ser	Val	Phe 30	Leu	Gly	
ctg	tgg	att	ttc	gga	tgg	ggg	aag	att	cct	ggt	tgg	ttg	cac	act	gca	144
Leu	Trp	Ile 35	Phe	Gly	Trp	Gly	Lys 40	Ile	Pro	Gly	Trp	Leu	His 45	Thr	Ala	
tcc	att	tgg	atc	gtt	gct	att	gcg	acg	aat	att	tct	gcc	tat	ttc	atc	192
Ser	Ile 50	Trp	Ile	Val	Ala	Ile 55	Ala	Thr	Asn	Ile 60	Ser	Ala	Tyr	Phe	Ile	
atc	gtg	gcc	aac	tcg	ttt	atg	cag	cat	ccg	gtg	ggt	gct	gag	tat	aac	240
Ile	Val	Ala	Asn	Ser	Phe 70	Met	Gln	His	Pro 75	Val	Gly	Ala	Glu	Tyr	Asn 80	
cct	gag	act	ggt	cgt	gcg	gag	ctt	act	gat	ttt	tgg	gct	ctt	ctc	aca	288
Pro	Glu	Thr	Gly	Arg 85	Ala	Glu	Leu	Thr	Asp 90	Phe	Trp	Ala	Leu	Leu	Thr 95	
aac	tcc	acc	gcg	ctg	gct	gcg	ttc	ccg	cat	gct	gtt	gcc	ggt	ggt	ttt	336
Asn	Ser	Thr	Ala 100	Leu	Ala	Ala	Phe	Pro 105	His	Ala	Val	Ala	Gly 110	Gly	Phe	
tta	aca	gct	gga	act	ttc	gtt	ctc	gga	att	tcg	ggt	tgg	tgg	att	att	384
Leu	Thr	Ala 115	Gly	Thr	Phe	Val	Leu 120	Gly	Ile	Ser	Gly	Trp	Trp	Ile	Ile	
cgt	gcg	cac	cgt	cag	gcc	aag	aag	gct	gag	tcg	gaa	atc	gag	tcg	aag	432
Arg	Ala	His	Arg	Gln	Ala 130	Lys	Lys 135	Ala	Glu	Ser	Glu	Ile	Glu	Ser	Lys	
cat	tcg	atg	cac	agg	ccc	gcg	ttg	tgg	gtt	ggt	tgg	tgg	acc	aca	gtt	480
His	Ser	Met	His	Arg 145	Pro	Ala 150	Leu	Trp	Val	Gly 155	Trp	Trp	Thr	Thr	Val 160	
gtc	tct	tcc	gtg	gcg	ctg	ttc	atc	act	ggc	gat	atc	cag	gcg	aag	ctc	528
Val	Ser	Ser	Val	Ala 165	Leu	Phe	Ile	Thr	Gly 170	Asp	Ile	Gln	Ala	Lys 175	Leu	
atg	ttc	gtg	caa	cag	cca	atg	aag	atg	gcg	tcg	gcg	gaa	tcc	ttg	tgt	576
Met	Phe	Val	Gln 180	Gln	Pro	Met	Lys 185	Met	Ala	Ser	Ala	Glu	Ser 190	Leu	Cys	
gaa	acc	gcc	aca	gat	cca	aac	ttc	tcc	att	ctg	aca	att	ggt	acg	cac	624
Glu	Thr	Ala 195	Thr	Asp	Pro	Asn	Phe 200	Ser	Ile	Leu	Thr	Ile 205	Gly	Thr	His	
aac	aac	tgc	gat	acg	gta	acc	cac	ctg	atc	gat	gtt	ccg	ttt	gtg	ctt	672
Asn	Asn	Cys 210	Asp	Thr	Val	Thr 215	His	Leu	Ile	Asp	Val 220	Pro	Phe	Val	Leu	
cca	ttc	ttg	gct	gaa	gga	aaa	ttc	acc	ggt	gtg	act	ttg	cag	ggt	gta	720
Pro	Phe	Leu	Ala	Glu	Gly 225	Lys	Phe 230	Thr	Gly	Val 235	Thr	Leu	Gln	Gly	Val 240	
aac	cag	ctc	caa	gct	gca	gca	gag	caa	gca	tac	ggt	cct	ggc	aac	tac	768
Asn	Gln	Leu	Gln	Ala	Ala	Ala	Glu	Gln	Ala	Tyr	Gly	Pro	Gly	Asn	Tyr	

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tcc cct aac ttg ttt gtc acc tac tgg tca ttc cgc gca atg atc ggc				816
Ser Pro Asn Leu Phe Val Thr Tyr Trp Ser Phe Arg Ala Met Ile Gly				
	260	265	270	
ctg atg ctt ggt tct ttg gct atc gct gcg att gcg tgg ctg ttg ctg				864
Leu Met Leu Gly Ser Leu Ala Ile Ala Ala Ile Ala Trp Leu Leu Leu				
	275	280	285	
cgt aag aag cgc aca cca act gga aag att gct cgt ctg ttc cag atc				912
Arg Lys Lys Arg Thr Pro Thr Gly Lys Ile Ala Arg Leu Phe Gln Ile				
	290	295	300	
ggc agc ctc att gct atc ccg ttc cca ttc ttg gcc aac tct gct ggt				960
Gly Ser Leu Ile Ala Ile Pro Phe Pro Phe Leu Ala Asn Ser Ala Gly				
	305	310	315	320
tgg atc ttc acc gag atg ggc cgc cag cct tgg gtg gtg cac ccg aac				1008
Trp Ile Phe Thr Glu Met Gly Arg Gln Pro Trp Val Val His Pro Asn				
	325	330	335	
cct gaa tct gcc ggc gat gcc cga aca gag atg atc cgg atg act gtt				1056
Pro Glu Ser Ala Gly Asp Ala Arg Thr Glu Met Ile Arg Met Thr Val				
	340	345	350	
gat atg ggt gta tct gat cat gcg cca tgg caa gtc tgg ctg act ctc				1104
Asp Met Gly Val Ser Asp His Ala Pro Trp Gln Val Trp Leu Thr Leu				
	355	360	365	
att ggc ttc acg att ctc tat ctc att ttg ttc gtg gtg tgg gtg tgg				1152
Ile Gly Phe Thr Ile Leu Tyr Leu Ile Leu Phe Val Val Trp Val Trp				
	370	375	380	
ctg att cgc cgc gca gtt ctg atc gga cca cca gag gaa ggc gct cca				1200
Leu Ile Arg Arg Ala Val Leu Ile Gly Pro Pro Glu Glu Gly Ala Pro				
	385	390	395	400
tcc gtg gag gca aag act gga ccg gca acc ccg att ggt tca gat atg				1248
Ser Val Glu Ala Lys Thr Gly Pro Ala Thr Pro Ile Gly Ser Asp Met				
	405	410	415	
ccc atg aca ccg ctg caa ttt act gcc gct gcc cca acc aca ggt gaa				1296
Pro Met Thr Pro Leu Gln Phe Thr Ala Ala Ala Pro Thr Thr Gly Glu				
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Lys Glu				

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<211> 434

<212> PRT

<213> Corynebacterium glutamicum

<400> 646

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Leu	Trp	Ile	Phe	Gly	Trp	Gly	Lys	Ile	Pro	Gly	Trp	Leu	His	Thr	Ala
		35					40					45			
Ser	Ile	Trp	Ile	Val	Ala	Ile	Ala	Thr	Asn	Ile	Ser	Ala	Tyr	Phe	Ile
		50					55					60			
Ile	Val	Ala	Asn	Ser	Phe	Met	Gln	His	Pro	Val	Gly	Ala	Glu	Tyr	Asn
		65					70					75			80
Pro	Glu	Thr	Gly	Arg	Ala	Glu	Leu	Thr	Asp	Phe	Trp	Ala	Leu	Leu	Thr
				85					90						95
Asn	Ser	Thr	Ala	Leu	Ala	Ala	Phe	Pro	His	Ala	Val	Ala	Gly	Gly	Phe
			100						105				110		
Leu	Thr	Ala	Gly	Thr	Phe	Val	Leu	Gly	Ile	Ser	Gly	Trp	Trp	Ile	Ile
		115					120					125			
Arg	Ala	His	Arg	Gln	Ala	Lys	Lys	Ala	Glu	Ser	Glu	Ile	Glu	Ser	Lys
		130					135					140			
His	Ser	Met	His	Arg	Pro	Ala	Leu	Trp	Val	Gly	Trp	Trp	Thr	Thr	Val
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Val	Ser	Ser	Val	Ala	Leu	Phe	Ile	Thr	Gly	Asp	Ile	Gln	Ala	Lys	Leu
				165					170					175	
Met	Phe	Val	Gln	Gln	Pro	Met	Lys	Met	Ala	Ser	Ala	Glu	Ser	Leu	Cys
			180					185					190		
Glu	Thr	Ala	Thr	Asp	Pro	Asn	Phe	Ser	Ile	Leu	Thr	Ile	Gly	Thr	His
		195					200					205			
Asn	Asn	Cys	Asp	Thr	Val	Thr	His	Leu	Ile	Asp	Val	Pro	Phe	Val	Leu
		210					215					220			
Pro	Phe	Leu	Ala	Glu	Gly	Lys	Phe	Thr	Gly	Val	Thr	Leu	Gln	Gly	Val
		225					230					235			240
Asn	Gln	Leu	Gln	Ala	Ala	Ala	Glu	Gln	Ala	Tyr	Gly	Pro	Gly	Asn	Tyr
				245					250					255	
Ser	Pro	Asn	Leu	Phe	Val	Thr	Tyr	Trp	Ser	Phe	Arg	Ala	Met	Ile	Gly
			260					265					270		
Leu	Met	Leu	Gly	Ser	Leu	Ala	Ile	Ala	Ala	Ile	Ala	Trp	Leu	Leu	Leu
			275				280					285			
Arg	Lys	Lys	Arg	Thr	Pro	Thr	Gly	Lys	Ile	Ala	Arg	Leu	Phe	Gln	Ile
		290					295					300			
Gly	Ser	Leu	Ile	Ala	Ile	Pro	Phe	Pro	Phe	Leu	Ala	Asn	Ser	Ala	Gly
		305					310					315			320
Trp	Ile	Phe	Thr	Glu	Met	Gly	Arg	Gln	Pro	Trp	Val	Val	His	Pro	Asn
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Pro	Glu	Ser	Ala	Gly	Asp	Ala	Arg	Thr	Glu	Met	Ile	Arg	Met	Thr	Val
			340					345					350		

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Asp Met Gly Val Ser Asp His Ala Pro Trp Gln Val Trp Leu Thr Leu
 355 360 365
 Ile Gly Phe Thr Ile Leu Tyr Leu Ile Leu Phe Val Val Trp Val Trp
 370 375 380
 Leu Ile Arg Arg Ala Val Leu Ile Gly Pro Pro Glu Glu Gly Ala Pro
 385 390 395 400
 Ser Val Glu Ala Lys Thr Gly Pro Ala Thr Pro Ile Gly Ser Asp Met
 405 410 415
 Pro Met Thr Pro Leu Gln Phe Thr Ala Ala Ala Pro Thr Thr Gly Glu
 420 425 430
 Lys Glu

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 <212> DNA
 <213> Corynebacterium glutamicum

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 <223> RXA00379

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 Met Ser Glu Ile Val 5
 gta gcc caa agc atc ggc cag cag ttt gct gac gtc gca gct tcc ggg 163
 Val Ala Gln Ser Ile Gly Gln Gln Phe Ala Asp Val Ala Ala Ser Gly 20
 cca ctg ttc ctt ggc atc ctt gcc gca gcg ctc gca ggt ctg gtg tct 211
 Pro Leu Phe Leu Gly Ile Leu Ala Ala Leu Ala Gly Leu Val Ser 35
 ttt gcc agc ccg tgt gtt gtg ccg ttg gtg cca gga tat att tcc tac 259
 Phe Ala Ser Pro Cys Val Val Pro Leu Val Pro Gly Tyr Ile Ser Tyr 50
 ctc gcc ggc gtg gtc ggt ggg gaa gtg gaa tac agc gct cat gcc acc 307
 Leu Ala Gly Val Val Gly Gly Glu Val Glu Tyr Ser Ala His Ala Thr 65

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 <212> PRT
 <213> Corynebacterium glutamicum

<400> 648
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 Ala Phe Pro Glu Trp Tyr Ala Thr Met Phe Ser Gly Met Tyr Leu Pro
 70 75 80 85

 ctg ttc ctc gtg ctt gtg tcg ttg atc atg cgc gtg gtg ggc ctt gaa 403
 Leu Phe Leu Val Leu Val Ser Leu Ile Met Arg Val Val Gly Leu Glu
 90 95 100

 tgg cgc aag aaa gtc gat gat cct cgt tgg caa aag tgg tct gac cgg 451
 Trp Arg Lys Lys Val Asp Asp Pro Arg Trp Gln Lys Trp Ser Asp Arg
 105 110 115

 gcc atc ttt att ggt tct tgg act cca ccg ctg atg tgg gga ttc atc 499
 Ala Ile Phe Ile Gly Ser Trp Thr Pro Pro Leu Met Trp Gly Phe Ile
 120 125 130

 ttc gcc aat att ttg cgt ggc atg ccc ctc aag gcg gat cac acc atc 547
 Phe Ala Asn Ile Leu Arg Gly Met Pro Leu Lys Ala Asp His Thr Ile
 135 140 145

 gat gct gcg gca gcc ctt cct ggc atg gtc aac gtc ttc gcc att ctg 595
 Asp Ala Ala Ala Ala Leu Pro Gly Met Val Asn Val Phe Ala Ile Leu
 150 155 160 165

 ggt gca ctt gcg ttc acc gca ctg ttc gcc ctt cat ggt ctc gca ttc 643
 Gly Ala Leu Ala Phe Thr Ala Leu Phe Ala Leu His Gly Leu Ala Phe
 170 175 180

 atc cgc ctg aaa act gct ggt cgg gtg cgc acc gat gcg gcg aag gca 691
 Ile Arg Leu Lys Thr Ala Gly Arg Val Arg Thr Asp Ala Ala Lys Ala
 185 190 195

 gct cca gta gtc gca ctt ctt gct gcg gtg act ggt gga cct ttc gtg 739
 Ala Pro Val Val Ala Leu Leu Ala Ala Val Thr Gly Gly Pro Phe Val
 200 205 210

 ttg tgg gct gcc atc gca tac ggc cgt tcc tgg tcc tgg atc ctc gca 787
 Leu Trp Ala Ala Ile Ala Tyr Gly Arg Ser Trp Ser Trp Ile Leu Ala
 215 220 225

 gtg ctg atc atc gca gcg gtt ctc ggt gga gct ttc gca ctg atc aaa 835
 Val Leu Ile Ile Ala Ala Val Leu Gly Gly Ala Phe Ala Leu Ile Lys
 230 235 240 245

 gac cgc gat gga tta agc ttc ctg tcc act tcc gtc gct gtc atc ggt 883
 Asp Arg Asp Gly Leu Ser Phe Leu Ser Thr Ser Val Ala Val Ile Gly
 250 255 260

 gtc gtt gca ctg ctg ttt 901
 Val Val Ala Leu Leu Phe
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<210> 652

<211> 267

<212> PRT

<213> Corynebacterium glutamicum

<400> 652

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tac ggt gag ctc gtt acc gtt gat gat cct tgg ggt tac ggc aac tcc 1555
 Tyr Gly Glu Leu Val Thr Val Asp Asp Pro Trp Gly Tyr Gly Asn Ser
 470 475 480 485

ctg gag tgg gca acc tcc tgc cct cct cct cgc cac aac ttc gca tcc 1603
 Leu Glu Trp Ala Thr Ser Cys Pro Pro Pro Arg His Asn Phe Ala Ser
 490 495 500

ttg cct cgt atc cgc tcc gag cgc cct gcg ttc gag ctg cac tac ccg 1651
 Leu Pro Arg Ile Arg Ser Glu Arg Pro Ala Phe Glu Leu His Tyr Pro
 505 510 515

cac atg att gaa cgc atg cgc gca gag gca cac act gga cat cac gat 1699
 His Met Ile Glu Arg Met Arg Ala Glu Ala His Thr Gly His His Asp
 520 525 530

gat att aat gct cca gaa ttg ggt acc gcc cca gcc ctt gca tct gac 1747
 Asp Ile Asn Ala Pro Glu Leu Gly Thr Ala Pro Ala Leu Ala Ser Asp
 535 540 545

tcc agc cgc taaaagcgtc tgatttaagt cgg 1779
 Ser Ser Arg
 550

<210> 654

<211> 552

<212> PRT

<213> Corynebacterium glutamicum

<400> 654

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Ser Phe Ser Phe Phe Phe Leu Gly Gly Leu Met Ala Leu Leu Ile Arg
 20 25 30

Ala Glu Leu Phe Thr Pro Gly Leu Gln Phe Leu Ser Asn Glu Gln Phe
 35 40 45

Asn Gln Leu Phe Thr Met His Gly Thr Val Met Leu Leu Leu Tyr Gly
 50 55 60

Thr Pro Ile Val Trp Gly Phe Ala Asn Tyr Val Leu Pro Leu Gln Ile
 65 70 75 80

Gly Ala Pro Asp Val Ala Phe Pro Arg Leu Asn Ala Phe Gly Phe Trp
 85 90 95

Ile Thr Thr Val Gly Gly Val Ala Met Leu Thr Gly Phe Leu Thr Pro
 100 105 110

Gly Gly Ala Ala Asp Phe Gly Trp Thr Met Tyr Ser Pro Leu Ser Asp
 115 120 125

Ala Ile His Ser Pro Gly Leu Gly Ser Asp Met Trp Ile Val Gly Val
 130 135 140

Gly Ala Thr Gly Ile Gly Ser Val Ala Ser Ala Ile Asn Met Leu Thr
 145 150 155 160

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Thr Ile Leu Cys Leu Arg Ala Pro Gly Met Thr Met Phe Arg Met Pro
 165 170 175
 Ile Phe Thr Trp Asn Ile Phe Val Val Ser Val Leu Ala Leu Ile
 180 185 190
 Phe Pro Leu Leu Leu Ala Ala Ala Leu Gly Val Leu Tyr Asp Arg Lys
 195 200 205
 Leu Gly Gly His Leu Tyr Asp Pro Ala Asn Gly Gly Ser Leu Leu Trp
 210 215 220
 Gln His Leu Phe Trp Phe Phe Gly His Pro Glu Val Tyr Val Leu Ala
 225 230 235 240
 Leu Pro Phe Phe Gly Ile Val Ser Glu Ile Ile Pro Val Phe Ser Arg
 245 250 255
 Lys Pro Met Phe Gly Tyr Val Gly Leu Ile Phe Ala Thr Leu Ser Ile
 260 265 270
 Gly Ala Leu Ser Met Ala Val Trp Ala His His Met Phe Val Thr Gly
 275 280 285
 Ala Val Leu Leu Pro Phe Phe Ser Phe Met Thr Phe Leu Ile Ser Val
 290 295 300
 Pro Thr Gly Val Lys Phe Phe Asn Trp Val Gly Thr Met Trp Lys Gly
 305 310 315 320
 His Ile Thr Trp Glu Thr Pro Met Ile Trp Ser Val Gly Phe Met Ala
 325 330 335
 Thr Phe Leu Phe Gly Gly Leu Thr Gly Ile Met Leu Ala Ser Pro Pro
 340 345 350
 Leu Asp Phe His Leu Ala Asp Ser Tyr Phe Leu Ile Ala His Phe His
 355 360 365
 Tyr Thr Leu Phe Gly Thr Val Val Phe Ala Ser Cys Ala Gly Val Tyr
 370 375 380
 Phe Trp Phe Pro Lys Met Thr Gly Arg Met Met Asp Glu Arg Leu Gly
 385 390 395 400
 Lys Ile His Phe Trp Leu Thr Phe Val Gly Phe His Gly Thr Phe Leu
 405 410 415
 Ile Gln His Trp Val Gly Asn Met Gly Met Pro Arg Arg Tyr Ala Asp
 420 425 430
 Tyr Leu Asp Ser Asp Gly Phe Thr Ile Tyr Asn Gln Ile Ser Thr Val
 435 440 445
 Phe Tyr Phe Leu Leu Gly Leu Ser Val Ile Pro Phe Ile Trp Asn Val
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 Phe Lys Ser Trp Arg Tyr Gly Glu Leu Val Thr Val Asp Asp Pro Trp
 465 470 475 480

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<212> DNA
<213> Corynebacterium glutamicum
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gacaggccat																
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						Met		Thr	Thr	Thr	Asp	5				
						1										
cac	aag	cag	ctg	ggc	att	atg	tac	atc	att	atg	tcc	ttc	agc	ttc	ttt	163
His	Lys	Gln	Leu	Gly	Ile	Met	Tyr	Ile	Ile	Met	Ser	Phe	Ser	Phe	Phe	
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ttc																
ctc	ggt	ggc	ttg	atg	gcc	ctg	ctt	atc	cga	gcg	gag	ctt	ttc	acc	211	
Phe	Leu	Gly	Gly	Leu	Met	Ala	Leu	Leu	Ile	Arg	Ala	Glu	Leu	Phe	Thr	
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cct																
ggt	ctg	cag	ttc	ctg	tct	aat	gag	cag	ttc	aac	cag	ctg	ttc	acc	259	
Pro	Gly	Leu	Gln	Phe	Leu	Ser	Asn	Glu	Gln	Phe	Asn	Gln	Leu	Phe	Thr	
				40		45				50						
atg																
cac	gga	act	gtc	atg	ctg	ctg	ctg	tac	gga	act	cca	att	gtt	tgg	307	
Met	His	Gly	Thr	Val	Met	Leu	Leu	Tyr	Gly	Thr	Pro	Ile	Val	Trp		
		55		60				65								
ggt																
ttt	gct	aac	tac	gtc	ctg	cca	ctt	cca	acc	acc	ang	caa	gcc	ttc	355	
Gly	Phe	Ala	Asn	Tyr	Val	Leu	Pro	Leu	Pro	Thr	Thr	Xaa	Gln	Ala	Phe	
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tct																
aaa	acc	cgg	gtg	aac	tct	ccc	agg	gag								385
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<213> Corynebacterium glutamicum

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Ala Glu Leu Phe Thr Pro Gly Leu Gln Phe Leu Ser Asn Glu Gln Phe
          35          40          45

Asn Gln Leu Phe Thr Met His Gly Thr Val Met Leu Leu Leu Tyr Gly
 50          55          60

Thr Pro Ile Val Trp Gly Phe Ala Asn Tyr Val Leu Pro Leu Pro Thr
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                      Leu Ser Ile Gly Ala
                      1          5

ctg tcc atg gct gtg tgg gct cac cac atg ttc gtt act ggc gca gtt 163
Leu Ser Met Ala Val Trp Ala His His Met Phe Val Thr Gly Ala Val
          10          15          20

ttg ctt ccg ttc ttc tcc ttc atg acg ttc ctg att tcg gtt cct acc 211
Leu Leu Pro Phe Phe Ser Phe Met Thr Phe Leu Ile Ser Val Pro Thr
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ggc gtt aag ttc ttc aac tgg gtt gga acc atg tgg aag ggt cac atc 259
Gly Val Lys Phe Phe Asn Trp Val Gly Thr Met Trp Lys Gly His Ile
          40          45          50

act tgg gaa acc cca atg atc tgg tct gtt ggc ttc atg gct acc ttc 307
Thr Trp Glu Thr Pro Met Ile Trp Ser Val Gly Phe Met Ala Thr Phe
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ctc ttc ggt ggt ctg acc ggc att atg ctg gcg tcc cca cca ctg gac 355
Leu Phe Gly Gly Leu Thr Gly Ile Met Leu Ala Ser Pro Pro Leu Asp
          70          75          80          85

ttc cac ttg gct gac tcc tac ttc ctg atc gcg cac ttc cac tac acc 403
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09602740-062300


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145						150						155					
Glu	Ile	Asp	Gly	Ser	Leu	Ala	Pro	Gly	Gly	Gln	Asp	Tyr	Gln	Gly	Ser		
165						170						175					
Asp	Pro	Glu	Arg	Gln	Ala	Ala	Ala	Glu	Ala	Ser	Lys	Lys	Asp	Pro	Ser		
180						185						190					
Gly	Asp	Asn	Pro	Ile	His	Gly	Asn	Ser	Lys	Ser	Asp	Val	Ser	Tyr	Leu		
195						200						205					
Glu	Phe	Asn	Arg	Ile	Glu	Thr	Leu	Gly	Thr	Thr	Asp	Glu	Ile	Pro	Val		
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Met	Val	Leu	Pro	Val	Asn	Thr	Pro	Ile	Glu	Phe	Asn	Leu	Ala	Ser	Ala		
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Asp	Val	Ala	His	Ser	Phe	Trp	Val	Pro	Glu	Phe	Leu	Phe	Lys	Arg	Asp		
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260						265						270					
Glu	Glu	Ile	Thr	Glu	Glu	Gly	Ala	Phe	Val	Gly	Arg	Cys	Ala	Glu	Met		
275						280						285					
Cys	Gly	Thr	Tyr	His	Ala	Met	Met	Asn	Phe	Glu	Leu	Arg	Val	Val	Asp		
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Arg	Asp	Ser	Phe	Ala	Glu	Tyr	Ile	Ser	Phe	Arg	Asp	Ser	Asn	Pro	Asp		
305						310						315					
Ala	Thr	Asn	Ala	Gln	Ala	Leu	Glu	His	Ile	Gly	Gln	Ala	Pro	Tyr	Ala		
325						330						335					
Thr	Ser	Thr	Ser	Pro	Phe	Val	Ser	Asp	Arg	Thr	Ala	Thr	Arg	Asp	Gly		
340						345						350					
Glu	Asn	Thr	Gln	Ser	Asn	Ala											
355																	

<210> 663

<211> 774

<212> DNA

<213> Corynebacterium glutamicum

<220>

<221> CDS

<222> (101)..(751)

<223> RXA02142

<400> 663

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00E290"0420960

aagccgagtt caaactttca attgaaacgg ggggcttgaa gtg act ttg gcc aac 115
Val Thr Leu Ala Asn
1 5

caa aca gcc ata cta gat agc gtg acg agc gca gtt gga aat aca ggt 163
Gln Thr Ala Ile Leu Asp Ser Val Thr Ser Ala Val Gly Asn Thr Gly
10 15 20

atg gca gca cca caa cgt gtt gcg gca ctg aac cgt ccg aat atg gtc 211
Met Ala Ala Pro Gln Arg Val Ala Ala Leu Asn Arg Pro Asn Met Val
25 30 35

agt gtc ggc acc att gtg ttc ctg tct cag gaa tta atg ttc ttc gcc 259
Ser Val Gly Thr Ile Val Phe Leu Ser Gln Glu Leu Met Phe Phe Ala
40 45 50

ggg cta ttc gcg atg tac ttc gtg tcc cgt gcg aac gga ctg gca aat 307
Gly Leu Phe Ala Met Tyr Phe Val Ser Arg Ala Asn Gly Leu Ala Asn
55 60 65

gga tca tgg gga gag cag aca gat cac ctc aac gtg ccc tac gca ctg 355
Gly Ser Trp Gly Glu Gln Thr Asp His Leu Asn Val Pro Tyr Ala Leu
70 75 80 85

ttg att acg gtc att ctg gtg tct tcc tca gtg act tgc cag ttc gga 403
Leu Ile Thr Val Ile Leu Val Ser Ser Ser Val Thr Cys Gln Phe Gly
90 95 100

gtt ttt gcg gct gaa agg ggt gac gtt tac ggc ctc cgc aag tgg ttc 451
Val Phe Ala Ala Glu Arg Gly Asp Val Tyr Gly Leu Arg Lys Trp Phe
105 110 115

ttg gtc acg att atc ctc gga tca atc ttc gtg atc gga cag ggc tac 499
Leu Val Thr Ile Ile Leu Gly Ser Ile Phe Val Ile Gly Gln Gly Tyr
120 125 130

gag tac atc act ctc gta ggt cac gga ctt aca atc cag agc agt gtc 547
Glu Tyr Ile Thr Leu Val Gly His Gly Leu Thr Ile Gln Ser Ser Val
135 140 145

tac gga tcg gca ttc ttt att aca acc ggt ttc cac gca ctg cac gtg 595
Tyr Gly Ser Ala Phe Phe Ile Thr Thr Gly Phe His Ala Leu His Val
150 155 160 165

atc gcg ggt gtt atg gcc ttc gtt gtg gtt ctt atg aga atc cat aag 643
Ile Ala Gly Val Met Ala Phe Val Val Val Leu Met Arg Ile His Lys
170 175 180

tcg aag ttc act ccg gca cag gca acc gca gca atg gtt gtg tct tat 691
Ser Lys Phe Thr Pro Ala Gln Ala Thr Ala Ala Met Val Val Ser Tyr
185 190 195

tac tgg cac ttc gtt gac gtg gtc tgg atc ggc ctc ttc atc act att 739
Tyr Trp His Phe Val Asp Val Val Trp Ile Gly Leu Phe Ile Thr Ile
200 205 210

tac ttc att cag taggcagtaa ggaatcctca acg 774
Tyr Phe Ile Gln
215

09602740-062300

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<210> 664
<211> 217
<212> PRT
<213> Corynebacterium glutamicum
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Arg	Pro	Asn	Met	Val	Ser	Val	Gly	Thr	Ile	Val	Phe	Leu	Ser	Gln	Glu
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Leu	Met	Phe	Phe	Ala	Gly	Leu	Phe	Ala	Met	Tyr	Phe	Val	Ser	Arg	Ala
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Asn	Gly	Leu	Ala	Asn	Gly	Ser	Trp	Gly	Glu	Gln	Thr	Asp	His	Leu	Asn
65					70					75					80
Val	Pro	Tyr	Ala	Leu	Leu	Ile	Thr	Val	Ile	Leu	Val	Ser	Ser	Ser	Val
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Thr	Cys	Gln	Phe	Gly	Val	Phe	Ala	Ala	Glu	Arg	Gly	Asp	Val	Tyr	Gly
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Leu	Arg	Lys	Trp	Phe	Leu	Val	Thr	Ile	Ile	Leu	Gly	Ser	Ile	Phe	Val
		115					120					125			
Ile	Gly	Gln	Gly	Tyr	Glu	Tyr	Ile	Thr	Leu	Val	Gly	His	Gly	Leu	Thr
	130					135					140				
Ile	Gln	Ser	Ser	Val	Tyr	Gly	Ser	Ala	Phe	Phe	Ile	Thr	Thr	Gly	Phe
145					150					155					160
His	Ala	Leu	His	Val	Ile	Ala	Gly	Val	Met	Ala	Phe	Val	Val	Val	Leu
				165					170					175	
Met	Arg	Ile	His	Lys	Ser	Lys	Phe	Thr	Pro	Ala	Gln	Ala	Thr	Ala	Ala
			180					185					190		
Met	Val	Val	Ser	Tyr	Tyr	Trp	His	Phe	Val	Asp	Val	Val	Trp	Ile	Gly
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<211> 1347
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<220>
<221> CDS
<222> (101)..(1324)
<223> RXA02144
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gac Asp	aaa Lys	cag Gln	tac Tyr	aca Thr 10	acc Thr	caa Gln	gaa Glu	ctc Leu	aac Asn 15	gcg Ala	atg Met	agc Ser	aat Asn	gag Glu 20	gat Asp	163
ctt Leu	gca Ala	cga Arg	ctt Leu 25	ggg Gly	aca Thr	gag Glu	ctg Leu	gac Asp 30	gac Asp	gtt Val	acc Thr	att Ile	gca Ala 35	tac Tyr	cgc Arg	211
aag Lys	gaa Glu	cgt Arg 40	ttc Phe	cca Pro	atc Ile	gct Ala	aat Asn 45	gac Asp	cca Pro	gct Ala	gag Glu	aag Lys 50	cgc Arg	gct Ala	gca Ala	259
cgt Arg	gca Ala 55	gtt Val	act Thr	ttc Phe	tgg Trp	cta Leu 60	gtc Val	ctc Leu	ggc Gly	atc Ile	att Ile 65	ggg Gly	gga Gly	ctt Leu	ggg Gly	307
ttc Phe 70	ctg Leu	gct Ala	acc Thr	tac Tyr	att Ile 75	ttc Phe	tgg Trp	cct Pro	tgg Trp	gag Glu 80	tac Tyr	aag Lys	gca Ala	cac His	gga Gly 85	355
gat Asp	gaa Glu	ggg Gly	ctc Leu	ctg Leu 90	gcg Ala	tac Tyr	acc Thr	ttg Leu	tac Tyr 95	acc Thr	cca Pro	atg Met	ctg Leu 100	ggg Gly	att Ile	403
act Thr	tcc Ser	ggg Gly	ctt Leu 105	tgc Cys	atc Ile	ctg Leu	tcc Ser	ctg Leu 110	gga Gly	ttt Phe	gca Ala	gtt Val	gtc Val 115	ctt Leu	tat Tyr	451
gtc Val	aag Lys	aag Lys 120	ttc Phe	att Ile	cca Pro	gag Glu	gaa Glu 125	atc Ile	gca Ala	gta Val	cag Gln	cgt Arg 130	cgc Arg	cac His	gac Asp	499
ggg Gly	cct Pro 135	tct Ser	gaa Glu	gaa Glu	gtt Val	gac Asp 140	cgc Arg	cgc Arg	acc Thr	atc Ile	gtt Val 145	gca Ala	ctt Leu	ctc Leu	aat Asn	547
gac Asp 150	tct Ser	tgg Trp	cag Gln	acc Thr	tct Ser 155	act Thr	ctt Leu	ggg Gly	cgt Arg	cgc Arg 160	aag Lys	ctg Leu	atc Ile	atg Met	gga Gly 165	595
ctt Leu	gca Ala	ggg Gly	ggc Gly	gga Gly 170	gca Ala	gta Val	ctg Leu	gcc Ala	ggc Gly 175	ctg Leu	acc Thr	atc Ile	atc Ile	gct Ala 180	cca Pro	643
atg Met	ggc Gly	ggg Gly	atg Met 185	atc Ile	aag Lys	aac Asn	cct Pro	tgg Trp 190	aat Asn	cct Pro	aag Lys	gaa Glu	ggc Gly 195	cca Pro	atg Met	691
gac Asp	gtt Val	cag Gln 200	ggg Gly	gac Asp	ggc Gly	acc Thr	ctg Leu 205	tgg Trp	act Thr	tcc Ser	ggg Gly	tgg Trp 210	act Thr	ctc Leu	gtt Val	739
gag Glu	aac Asn 215	gac Asp	gtc Val	aag Lys	gtt Val	tac Tyr 220	ctc Leu	ggc Gly	cgc Arg	gac Asp	act Thr 225	gca Ala	gca Ala	att Ile	gcg Ala	787

Thr Ile Ala Tyr Arg Lys Glu Arg Phe Pro Ile Ala Asn Asp Pro Ala
 35 40 45
 Glu Lys Arg Ala Ala Arg Ala Val Thr Phe Trp Leu Val Leu Gly Ile
 50 55 60
 Ile Gly Gly Leu Gly Phe Leu Ala Thr Tyr Ile Phe Trp Pro Trp Glu
 65 70 75 80
 Tyr Lys Ala His Gly Asp Glu Gly Leu Leu Ala Tyr Thr Leu Tyr Thr
 85 90 95
 Pro Met Leu Gly Ile Thr Ser Gly Leu Cys Ile Leu Ser Leu Gly Phe
 100 105 110
 Ala Val Val Leu Tyr Val Lys Lys Phe Ile Pro Glu Glu Ile Ala Val
 115 120 125
 Gln Arg Arg His Asp Gly Pro Ser Glu Glu Val Asp Arg Arg Thr Ile
 130 135 140
 Val Ala Leu Leu Asn Asp Ser Trp Gln Thr Ser Thr Leu Gly Arg Arg
 145 150 155 160
 Lys Leu Ile Met Gly Leu Ala Gly Gly Gly Ala Val Leu Ala Gly Leu
 165 170 175
 Thr Ile Ile Ala Pro Met Gly Gly Met Ile Lys Asn Pro Trp Asn Pro
 180 185 190
 Lys Glu Gly Pro Met Asp Val Gln Gly Asp Gly Thr Leu Trp Thr Ser
 195 200 205
 Gly Trp Thr Leu Val Glu Asn Asp Val Lys Val Tyr Leu Gly Arg Asp
 210 215 220
 Thr Ala Ala Ile Ala Glu Ser His Thr Asp Ala Thr Gly Glu His Trp
 225 230 235 240
 Ser Thr Thr Gly Val Ser Arg Leu Val Arg Met Arg Pro Glu Asp Leu
 245 250 255
 Ala Ala Ala Ser Met Glu Thr Val Phe Pro Leu Pro Ala Glu Met Val
 260 265 270
 Asn Asp Gly Ala Glu Tyr Asp Pro Ala Lys Asp Val Tyr Glu His Gln
 275 280 285
 Met His Ser Val His Gly Pro Arg Asn Ala Val Met Leu Ile Arg Leu
 290 295 300
 Arg Thr Ala Asp Ala Glu Lys Val Ile Glu Arg Glu Gly Gln Glu Ser
 305 310 315 320
 Phe His Tyr Gly Asp Tyr Tyr Ala Tyr Ser Lys Ile Cys Thr His Ile
 325 330 335
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 340 345 350
 Pro Cys His Gln Ser Gln Phe Asp Ala Leu His Tyr Gly Lys Pro Val

002290"0420960

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tatgagtgat	ttgaaaatgc	aacgttctgg	aggagaaccc	ttg	gac	acg	atc	aag	115								
				Leu	Asp	Thr	Ile	Lys	5								
gcc	tat	att	gcg	cta	acg	aag	ccc	agg	gtt	att	gaa	ctc	ctc	ctt	gtc	163	
Ala	Tyr	Ile	Ala	Leu	Thr	Lys	Pro	Arg	Val	Ile	Glu	Leu	Leu	Leu	Val	20	
				10					15								
gcc	aca	atc	ccc	aca	atg	ctt	cag	gct	gaa	cgc	ggg	gag	aac	aac	att	211	
Ala	Thr	Ile	Pro	Thr	Met	Leu	Gln	Ala	Glu	Arg	Gly	Glu	Asn	Asn	Ile	35	
			25					30									
gtg	ctc	atc	ttg	ctg	act	gtg	ttc	ggg	ggc	tgg	atg	ggg	gcg	gcc	gcc	259	
Val	Leu	Ile	Leu	Leu	Thr	Val	Phe	Gly	Gly	Trp	Met	Gly	Ala	Ala	Ala	50	
		40					45					50					
gcc	aac	acc	ttc	aac	atg	gtg	gca	gac	tcc	gat	att	gat	cag	cgc	atg	307	
Ala	Asn	Thr	Phe	Asn	Met	Val	Ala	Asp	Ser	Asp	Ile	Asp	Gln	Arg	Met	65	
	55					60					65						
gga	cgc	act	agg	gct	cgc	cct	ttg	gtg	cgc	cac	acc	gtg	agt	aat	cgc	355	
Gly	Arg	Thr	Arg	Ala	Arg	Pro	Leu	Val	Arg	His	Thr	Val	Ser	Asn	Arg	85	
	70				75					80							
gac	gcc	tcc	att	ttt	gcg	tgg	gtc	ctg	aca	gtg	gcc	agc	ttc	ttg	tgg	403	
Asp	Ala	Ser	Ile	Phe	Ala	Trp	Val	Leu	Thr	Val	Ala	Ser	Phe	Leu	Trp	100	
				90					95					100			
ctg	tgg	ctg	ctg	tgc	gat	tgc	atg	ctc	gcc	ggc	atc	ttc	gtg	ttg	atc	451	
Leu	Trp	Leu	Leu	Cys	Asp	Ser	Met	Leu	Ala	Gly	Ile	Phe	Val	Leu	Ile	115	
			105					110					115				
acg	att	ttc	ttc	tac	att	ttt	gtc	tac	acc	aag	tgg	ctg	aag	cgc	cgc	499	
Thr	Ile	Phe	Phe	Tyr	Ile	Phe	Val	Tyr	Thr	Lys	Trp	Leu	Lys	Arg	Arg	120	
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<222> (101)..(1138)

<223> RXA02743

<400> 669

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                               Val Ser Thr Ser Asp
                               1 5

gctccc tcaaat aatcca gttgag ttgaag cccatt actttc tgggca 163
Ala Pro Ser Asn Asn Pro Val Glu Leu Lys Pro Ile Thr Phe Trp Ala
                               10 15 20

ccgacc atcaaa gtgcag cgcatt ctcgcg ctccta ctgttg attttc 211
Pro Thr Ile Lys Val Gln Arg Ile Leu Ala Leu Leu Leu Ile Phe
                               25 30 35

caggga ggc atcacc gttacg ggc tctatc gtc cgtgtc aca ggc tcc 259
Gln Gly Gly Ile Thr Val Thr Gly Ser Ile Val Arg Val Thr Gly Ser
                               40 45 50

ggcctc ggttgt gat acc tggcca cta tgc cac gaa ggt tca cta gtc 307
Gly Leu Gly Cys Asp Thr Trp Pro Leu Cys His Glu Gly Ser Leu Val
                               55 60 65

cca gtc gca ggc gca gca cca tgg atc cac cag gca gtg gaa ttt ggt 355
Pro Val Ala Gly Ala Ala Pro Trp Ile His Gln Ala Val Glu Phe Gly
                               70 75 80 85

aac cgc atg ctc act ttc gtg ctt gct gcc gca gcg ctt gcg ttg ttc 403
Asn Arg Met Leu Thr Phe Val Leu Ala Ala Ala Leu Ala Leu Phe
                               90 95 100

att gca gtt ctt ggc gca aaa cgc cgc cgc gag atc ctg gtc cat tcc 451
Ile Ala Val Leu Gly Ala Lys Arg Arg Arg Glu Ile Leu Val His Ser
                               105 110 115

ttc atc cag ggt ttg ggc atc atc ttg cag gct gtc atc ggt ggc atc 499
Phe Ile Gln Gly Leu Gly Ile Ile Leu Gln Ala Val Ile Gly Gly Ile
                               120 125 130

acc gtg ctg gtt gat ttg cac tgg tac gcc gtt gct ttg cac ttc ctg 547
Thr Val Leu Val Asp Leu His Trp Tyr Ala Val Ala Leu His Phe Leu
                               135 140 145

cca tcc atg atc ctt gtt ttc atg gcc gcg att ttg tac acc cgc atc 595
Pro Ser Met Ile Leu Val Phe Met Ala Ala Ile Leu Tyr Thr Arg Ile
                               150 155 160 165

ggc gag ccc gat gac ggc gag att acc acc aca ttc ccc acg tgg atc 643
Gly Glu Pro Asp Asp Gly Glu Ile Thr Thr Thr Phe Pro Thr Trp Ile
                               170 175 180

cgc aat gta gct gtc att ggt gca gta gcg ctc tcc gta gta ctg atc 691
Arg Asn Val Ala Val Ile Gly Ala Val Ala Leu Ser Val Val Leu Ile
                               185 190 195

acc ggc acc atg acc acc ggc gct ggc gtt cac tct ggc gat gca tca 739
Thr Gly Thr Met Thr Thr Gly Ala Gly Val His Ser Gly Asp Ala Ser

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<400> 670
Val Ser Thr Ser Asp Ala Pro Ser Asn Asn Pro Val Glu Leu Lys Pro
  1          5          10          15

Ile Thr Phe Trp Ala Pro Thr Ile Lys Val Gln Arg Ile Leu Ala Leu
      20          25          30

Leu Leu Leu Ile Phe Gln Gly Gly Ile Thr Val Thr Gly Ser Ile Val
    35          40          45

Arg Val Thr Gly Ser Gly Leu Gly Cys Asp Thr Trp Pro Leu Cys His
  50          55          60

Glu Gly Ser Leu Val Pro Val Ala Gly Ala Ala Pro Trp Ile His Gln
  65          70          75          80

Ala Val Glu Phe Gly Asn Arg Met Leu Thr Phe Val Leu Ala Ala Ala

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85						90						95					
Ala	Leu	Ala	Leu	Phe	Ile	Ala	Val	Leu	Gly	Ala	Lys	Arg	Arg	Arg	Glu		
			100					105					110				
Ile	Leu	Val	His	Ser	Phe	Ile	Gln	Gly	Leu	Gly	Ile	Ile	Leu	Gln	Ala		
		115					120					125					
Val	Ile	Gly	Gly	Ile	Thr	Val	Leu	Val	Asp	Leu	His	Trp	Tyr	Ala	Val		
	130					135					140						
Ala	Leu	His	Phe	Leu	Pro	Ser	Met	Ile	Leu	Val	Phe	Met	Ala	Ala	Ile		
145					150					155					160		
Leu	Tyr	Thr	Arg	Ile	Gly	Glu	Pro	Asp	Asp	Gly	Glu	Ile	Thr	Thr	Thr		
				165					170					175			
Phe	Pro	Thr	Trp	Ile	Arg	Asn	Val	Ala	Val	Ile	Gly	Ala	Val	Ala	Leu		
			180					185					190				
Ser	Val	Val	Leu	Ile	Thr	Gly	Thr	Met	Thr	Thr	Gly	Ala	Gly	Val	His		
		195					200					205					
Ser	Gly	Asp	Ala	Ser	Ile	Thr	Met	Asp	Asp	Arg	Leu	Asp	Val	Ser	Ile		
	210					215					220						
Asp	Leu	Met	Ala	His	Ile	His	Gly	Tyr	Ser	Met	Tyr	Ile	Tyr	Leu	Phe		
225					230					235					240		
Phe	Thr	Leu	Ile	Val	Val	Ala	Gly	Leu	Tyr	Lys	Ala	Lys	Thr	Thr	Lys		
				245					250					255			
His	Asn	Lys	Gln	Leu	Gly	Leu	Met	Leu	Ile	Leu	Phe	Ile	Leu	Ile	Gln		
			260					265					270				
Ala	Gly	Ile	Gly	Ile	Leu	Gln	Tyr	Arg	Met	Gly	Val	Pro	Arg	Trp	Ser		
		275					280					285					
Ile	Pro	Phe	His	Ile	Ala	Met	Ser	Ser	Val	Val	Val	Ala	Phe	Thr	Ser		
	290					295				300							
Leu	Leu	Trp	Ala	Gln	Gly	Arg	Ile	Arg	Val	Gly	Gly	Lys	Ala	Thr	Val		
305					310					315					320		
Thr	Gly	Ser	Val	Asp	Gly	Asp	Ile	Lys	Asn	Glu	Ile	Ile	Thr	Asn	Pro		
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<213> Corynebacterium glutamicum
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<223> RXA01227
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SECRET

105

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<222> (101)..(415)  
<223> RXA01865
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Met Thr Tyr Thr Ile																5
1																
gca cag ccc tgc gtt gac gtc ttg gat cgt gcc tgc gtt gaa gaa tgc																163
Ala Gln Pro Cys Val Asp Val Leu Asp Arg Ala Cys Val Glu Glu Cys																20
10 15																
cca gta gat tgc atc tac gaa ggt aag cgc atg ctg tac atc cac ccg																211
Pro Val Asp Cys Ile Tyr Glu Gly Lys Arg Met Leu Tyr Ile His Pro																35
25 30																
gat gag tgc gtt gac tgt ggt gca tgt gag cct gct tgc cca gtt gag																259
Asp Glu Cys Val Asp Cys Gly Ala Cys Glu Pro Ala Cys Pro Val Glu																50
40 45																
gca atc ttc tac gag gac gat gtc cca gac gaa tgg ctt gac tac aac																307
Ala Ile Phe Tyr Glu Asp Asp Val Pro Asp Glu Trp Leu Asp Tyr Asn																65
55 60																
gat gcc aac gct gca ttc ttc gat gat ctg ggc tcc cca ggt ggt gcg																355
Asp Ala Asn Ala Ala Phe Phe Asp Asp Leu Gly Ser Pro Gly Gly Ala																85
70 75 80																
gct aag ctt gga cca caa gat ttt gat cac cca atg atc gct gcg ctg																403
Ala Lys Leu Gly Pro Gln Asp Phe Asp His Pro Met Ile Ala Ala Leu																100
90 95 100																
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Pro Pro Gln Ala																105

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<210> 674
<211> 105
<212> PRT
<213> Corynebacterium glutamicum
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20 25 30

[illegible]

Leu Tyr Ile His Pro Asp Glu Cys Val Asp Cys Gly Ala Cys Glu Pro
 35 40 45
 Ala Cys Pro Val Glu Ala Ile Phe Tyr Glu Asp Asp Val Pro Asp Glu
 50 55 60
 Trp Leu Asp Tyr Asn Asp Ala Asn Ala Ala Phe Phe Asp Asp Leu Gly
 65 70 75 80
 Ser Pro Gly Gly Ala Ala Lys Leu Gly Pro Gln Asp Phe Asp His Pro
 85 90 95
 Met Ile Ala Ala Leu Pro Pro Gln Ala
 100 105

<210> 675

<211> 441

<212> DNA

<213> Corynebacterium glutamicum

<220>

<221> CDS

<222> (101)..(418)

<223> RXA00680

<400> 675

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 Met Ser Thr Ile His
 1 5
 ttc att gat cat gct ggc aaa acc cgc acc atc gag gcg act gtt ggt 163
 Phe Ile Asp His Ala Gly Lys Thr Arg Thr Ile Glu Ala Thr Val Gly
 10 15 20
 gat tca gta atg gag acc gca gtc cga aac gga gtg cct gga att gtt 211
 Asp Ser Val Met Glu Thr Ala Val Arg Asn Gly Val Pro Gly Ile Val
 25 30 35
 gct gaa tgc ggc ggt tcc tta tcg tgt gca acc tgc cat gtg ttt gtt 259
 Ala Glu Cys Gly Gly Ser Leu Ser Cys Ala Thr Cys His Val Phe Val
 40 45 50
 gac cct gca cag tat gat gcg ctt ccc cca atg gag gag atg gaa gat 307
 Asp Pro Ala Gln Tyr Asp Ala Leu Pro Pro Met Glu Glu Met Glu Asp
 55 60 65
 gaa atg ctg tgg ggt gct gcc gtg gac cgt gag gat tgc tcc cgt ttg 355
 Glu Met Leu Trp Gly Ala Ala Val Asp Arg Glu Asp Cys Ser Arg Leu
 70 75 80 85
 tct tgc caa atc aag gtc acc gaa ggc atg gat ctt tcg ttg acc acg 403
 Ser Cys Gln Ile Lys Val Thr Glu Gly Met Asp Leu Ser Leu Thr Thr
 90 95 100
 cca gaa acg caa gtg tgagggttgaa tcatgaatac ttc 441
 Pro Glu Thr Gln Val
 105

09502740-062300

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<210> 676
<211> 106
<212> PRT
<213> Corynebacterium glutamicum
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      20             25             30

Val Pro Gly Ile Val Ala Glu Cys Gly Gly Ser Leu Ser Cys Ala Thr
      35             40             45

Cys His Val Phe Val Asp Pro Ala Gln Tyr Asp Ala Leu Pro Pro Met
      50             55             60

Glu Glu Met Glu Asp Glu Met Leu Trp Gly Ala Ala Val Asp Arg Glu
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Asp Cys Ser Arg Leu Ser Cys Gln Ile Lys Val Thr Glu Gly Met Asp
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Leu Ser Leu Thr Thr Pro Glu Thr Gln Val
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Met Asn Thr Ser Ala																
1 5																
gaa act gga atc ttg atc atc ggt gca aac caa tcg ggt gtg cag ctg																163
Glu Thr Gly Ile Leu Ile Ile Gly Ala Asn Gln Ser Gly Val Gln Leu																
10 15 20																
gcg att tcc ctg cgg gcc acg ggt ttc acc gaa tcg atc acg ctt cta																211
Ala Ile Ser Leu Arg Ala Thr Gly Phe Thr Glu Ser Ile Thr Leu Leu																
25 30 35																
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Gly Glu Glu Asp His Arg Pro Tyr Gln Arg Pro Ala Leu Ser Lys Glu																
40 45 50																
ttc ctc cag gac aag atc gac aaa gag cgt ctg att ttc cgt tcc aat																307
Phe Leu Gln Asp Lys Ile Asp Lys Glu Arg Leu Ile Phe Arg Ser Asn																
55 60 65																

gag	tat	tgg	gaa	gaa	aat	aat	att	cgc	ctg	gtc	aag	ggc	gtg	cgc	atc	355
Glu	Tyr	Trp	Glu	Glu	Asn	Asn	Ile	Arg	Leu	Val	Lys	Gly	Val	Arg	Ile	
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Glu	Arg	Ile	Glu	Lys	Asn	Asp	Asp	Gly	Ser	Gly	Val	Ala	Tyr	Gly	Ala	
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gga	caa	gaa	ttc	gct	ttt	cga	cgt	ctc	gct	cta	gcg	gtt	ggg	gcc	cgc	451
Gly	Gln	Glu	Phe	Ala	Phe	Arg	Arg	Leu	Ala	Leu	Ala	Val	Gly	Ala	Arg	
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Pro	Arg	His	Leu	Asp	Leu	Pro	Gly	Ala	Thr	Leu	Glu	Gly	Val	Thr	Tyr	
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ctg	cgc	aac	gcg	gac	gac	gcc	ttg	gcg	ctc	aaa	gcg	atg	att	ggg	tct	547
Leu	Arg	Asn	Ala	Asp	Asp	Ala	Leu	Ala	Leu	Lys	Ala	Met	Ile	Gly	Ser	
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Val	Thr	Asp	Ala	Val	Val	Val	Gly	Gly	Gly	Phe	Ile	Gly	Leu	Glu	Ala	
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Ala	Cys	Ser	Leu	His	Asp	Leu	Gly	Lys	Asn	Val	Thr	Val	Leu	Glu	Tyr	
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Gly	Pro	Arg	Leu	Ile	Gly	Arg	Ala	Val	Gly	Glu	Glu	Thr	Ala	Ala	Phe	
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ttc	ctc	gaa	caa	cac	cgt	tcc	cgt	ggc	gta	aat	atc	gtg	ctt	gat	gcc	739
Phe	Leu	Glu	Gln	His	Arg	Ser	Arg	Gly	Val	Asn	Ile	Val	Leu	Asp	Ala	
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cgc	atg	aaa	cag	ttt	gtg	ggc	aag	gat	gga	aag	ctc	agc	ggc	att	gag	787
Arg	Met	Lys	Gln	Phe	Val	Gly	Lys	Asp	Gly	Lys	Leu	Ser	Gly	Ile	Glu	
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Leu	Glu	Asp	Gly	Thr	Val	Ile	Pro	Ala	Gln	Leu	Val	Ile	Val	Gly	Ile	
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Gly	Val	Ile	Pro	Asn	Thr	Glu	Leu	Ala	Ala	Val	Leu	Gly	Leu	Asp	Ile	
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Asn	Asn	Gly	Ile	Val	Val	Asp	Lys	His	Ala	Val	Ala	Ser	Asp	Gly	Thr	
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Thr	Ile	Ala	Ile	Gly	Asp	Val	Ala	Asn	Ile	Pro	Asn	Pro	Ile	Pro	Gly	
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<210> 679

THE UNIVERSITY OF CHICAGO

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atc Ile	aat Asn 40	gag Glu	ttt Phe	gct Ala	ctg Leu	gag Glu	cag Gln 45	gca Ala	ctg Leu	cgc Arg	ttg Leu	cgg Arg 50	gag Glu	tcc Ser	aac Asn	259			
ccg Pro 55	gat Asp	gct Ala	ggg Gly	tac Tyr	cgc Arg	gtt Val 60	gtt Val	gcg Ala	ctg Leu	agc Ser	gcc Ala 65	ggc Gly	cct Pro	gcc Ala	ggg Gly	307			
ggg Gly 70	gaa Glu	gag Glu	gcg Ala	ctg Leu	cgt Arg 75	aag Lys	gcg Ala	ctg Leu	tcc Ser	atg Met 80	ggg Gly	gct Ala	gat Asp	gaa Glu	gca Ala 85	355			
atc Ile	cag Gln	ctc Leu	agt Ser 90	gat Asp	gat Asp	gcc Ala	ttg Leu	gct Ala	ggg Gly 95	tct Ser	gat Asp	ctt Leu	ttg Leu 100	gga Gly	acc Thr	403			
gct Ala	tgg Trp	gcg Ala	ctg Leu 105	aac Asn	aac Asn	gct Ala	atc Ile	aac Asn 110	acc Thr	atc Ile	gcg Ala	ggg Gly 115	gtt Val 115	gct Ala	ctc Leu	451			
atc Ile	gtg Val 120	acg Thr	ggg Gly	tcg Ser	gct Ala	tct Ser	tcc Ser 125	gat Asp	ggg Gly	tcc Ser	atg Met	ggg Gly 130	gcg Ala	ctt Leu	cct Pro	499			
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gcg Ala 150	ctg Leu	aag Lys	gtc Val	gag Glu	ggg Gly 155	gca Ala	tct Ser	att Ile	act Thr	gcc Ala 160	act Thr	cgc Arg	att Ile	gat Asp	aac Asn 165	595			
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tcc Ser	gat Asp	aag Lys 185	gct Ala	gac Asp	aag Lys	cca Pro	cgt Arg	ttc Phe 190	cct Pro	aac Asn	ttc Phe	aag Lys	ggc Gly 195	atc Ile	atg Met	691			
gct Ala	gct Ala	aag Lys 200	aag Lys	gct Ala	gag Glu	atc Ile	aag Lys 205	aag Lys	ctt Leu	tcc Ser	ttg Leu 210	gct Ala	gaa Glu	atc Ile	ggc Gly	739			
gtg Val	gct Ala 215	cca Pro	gag Glu	cag Gln	gtt Val	ggg Gly 220	ctg Leu	tct Ser	cac His	gcg Ala	gca Ala 225	act Thr	gct Ala	gtt Val	act Thr	787			
gct Ala 230	gca Ala	gct Ala	gat Asp	cgt Arg	cct Pro 235	gag Glu	cgc Arg	tcc Ser	caa Gln	ggg Gly 240	gat Asp	gtc Val	att Ile	ggg Gly	gca Ala 245	835			
tcg Ser	ggg Gly	gct Ala	gct Ala	gaa Glu 250	aag Lys	att Ile	gct Ala	gag Glu 255	tac Tyr	ctc Leu	gct Ala	tca Ser	gag Glu	aac Asn 260	ctc Leu	883			

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35 40 45

Leu Arg Glu Ser Asn Pro Asp Ala Gly Tyr Arg Val Val Ala Leu Ser
50 55 60

Ala Gly Pro Ala Gly Gly Glu Glu Ala Leu Arg Lys Ala Leu Ser Met
65 70 75 80

Gly Ala Asp Glu Ala Ile Gln Leu Ser Asp Asp Ala Leu Ala Gly Ser
85 90 95

Asp Leu Leu Gly Thr Ala Trp Ala Leu Asn Asn Ala Ile Asn Thr Ile
100 105 110

Ala Gly Val Ala Leu Ile Val Thr Gly Ser Ala Ser Ser Asp Gly Ser
115 120 125

Met Gly Ala Leu Pro Gly Val Leu Ala Glu Tyr Arg Gln Val Pro Ala
130 135 140

Leu Thr Asn Leu Ser Ala Leu Lys Val Glu Gly Ala Ser Ile Thr Ala
145 150 155 160

Thr Arg Ile Asp Asn His Gly Thr Tyr Glu Leu Gln Ala Ala Leu Pro
165 170 175

Ala Val Val Ser Ile Ser Asp Lys Ala Asp Lys Pro Arg Phe Pro Asn
180 185 190

Phe Lys Gly Ile Met Ala Ala Lys Lys Ala Glu Ile Lys Lys Leu Ser
195 200 205

Leu Ala Glu Ile Gly Val Ala Pro Glu Gln Val Gly Leu Ser His Ala
210 215 220

Ala Thr Ala Val Thr Ala Ala Ala Asp Arg Pro Glu Arg Ser Gln Gly
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Asp Val Ile Gly Ala Ser Gly Ala Ala Glu Lys Ile Ala Glu Tyr Leu
245 250 255

Ala Ser Glu Asn Leu Ile

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 Leu Asn Gln Gly Pro Glu Ile Thr Ser Gly Ala Asn Val Val Asn Thr
 515 520 525
 Ile Leu Val Glu Phe Arg Ala Leu Asp Thr Leu Gly Glu Leu Ser Val
 530 535 540
 Leu Gly Met Ala Ala Val Val Ile Gly Ala Met Val Ala Ser Met Pro
 545 550 555 560
 Arg His Pro Phe Ala Lys Gly Thr His Pro Arg Pro Phe Gly Gln Ser
 565 570 575
 Gln Leu Asn Ser Ile Pro Leu Arg Met Leu Leu Lys Val Leu Val Pro
 580 585 590
 Ala Leu Cys Phe Leu Ser Phe Met Val Phe Met Arg Gly His Asn Asp
 595 600 605
 Pro Gly Gly Gly Phe Ile Ala Ala Leu Ile Ala Gly Gly Ala Leu Met
 610 615 620
 Leu Leu Tyr Leu Ser Lys Ala Lys Asp Gly Arg Ile Phe Arg Pro Asn
 625 630 635 640
 Val Pro Phe Ile Leu Thr Gly Ala Gly Ile Leu Met Ala Val Phe Ser
 645 650 655
 Gly Val Leu Gly Leu Thr His Gly Ser Phe Leu Tyr Ala Ile His Phe
 660 665 670
 Asn Phe Val Gly Gln His Trp Thr Thr Ser Met Ile Phe Asp Leu Gly
 675 680 685
 Val Tyr Leu Ala Val Leu Gly Met Val Ser Met Ala Ile Asn Gly Leu
 690 695 700
 Gly Gly Tyr Leu Arg Pro Gly Thr Asp Asn Ala Asp Leu Asp Tyr Ala
 705 710 715 720
 Arg Arg Ser Gly Pro Leu Pro Ala Thr Pro Thr Val Glu Pro Glu Pro
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 Glu Gly Asp Glu Asp Trp Pro Glu Pro Ile Asn Pro Ala Gly Asp Asn
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 Lys Glu Glu Ala Asn Arg
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<223> FRXA00606

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                1 5

ccg ttg ctc ggc ttc gtg tcc aaa gaa ggc atg atc aca gcg ttc atg 163
Pro Leu Leu Gly Phe Val Ser Lys Glu Gly Met Ile Thr Ala Phe Met
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gac gcc ccc atc ggc aac tcc tat gtt gta tta ctg ctg gtc ggc gca 211
Asp Ala Pro Ile Gly Asn Ser Tyr Val Val Leu Leu Leu Val Gly Ala
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gca atc ggc gcg gtc cta acc ttc aca tac tcc gcg aaa ctc gtg ctc 259
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Gly Ala Phe Val Asp Gly Pro Arg Asp Met Ser His Val Lys Glu Ala
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ccc gtc tcc ctc tgg ctt ccg gcc gcc ctg cct gga ctt atg tct ctg 355
Pro Val Ser Leu Trp Leu Pro Ala Ala Leu Pro Gly Leu Met Ser Leu
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cca cta gtc cta gta ctt tcg ctt ttc gac gcc ccc gtc tcc gcc gca 403
Pro Leu Val Leu Val Leu Ser Leu Phe Asp Ala Pro Val Ser Ala Ala
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gcc acc tcc gcc gcg ggg gaa gcg gcg cac atg cac ctg gca ttg tgg 451
Ala Thr Ser Ala Ala Gly Glu Ala Ala His Met His Leu Ala Leu Trp
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cac ggc atc aac acc cca ctg ttg att tcc ttg ggt gtg ctg gtg gcc 499
His Gly Ile Asn Thr Pro Leu Leu Ile Ser Leu Gly Val Leu Val Ala
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gga atc ctt ggt gtg ctg ttc cgc aaa gag ctg tgg aaa atc gcc gag 547
Gly Ile Leu Gly Val Leu Phe Arg Lys Glu Leu Trp Lys Ile Ala Glu
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acc agc cct ttc ccc atc gcc aca ggc aac gac atc cta tcg atg ctg 595
Thr Ser Pro Phe Pro Ile Ala Thr Gly Asn Asp Ile Leu Ser Met Leu
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gtt tac cga gcc aac ttg ctg ggt aaa ttc ttc ggt cgc atg gct gat 643
Val Tyr Arg Ala Asn Leu Leu Gly Lys Phe Phe Gly Arg Met Ala Asp
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tcg atg agc cca cgc agg cac ttg gtc agc ctc atc gtg ctg ctc tgg 691
Ser Met Ser Pro Arg Arg His Leu Val Ser Leu Ile Val Leu Leu Trp
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gaa cac ggc ccg att gct cac aac gtg ggc ctt tat gtc ggt ggc gtg	307
Glu His Gly Pro Ile Ala His Asn Val Gly Leu Tyr Val Gly Gly Val	
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gca atc ccc ttt gct gcc gat acg ttc agc gcc atc atg ttg atc acc	355
Ala Ile Pro Phe Ala Ala Asp Thr Phe Ser Ala Ile Met Leu Ile Thr	
70 75 80 85	
acc tcg atc gtt gcg gtg gct gcc aac tgg ttt gcc acc atc gtc ggt	403
Thr Ser Ile Val Ala Val Ala Ala Asn Trp Phe Ala Thr Ile Val Gly	
90 95 100	
gaa acc cgc gcg cgt ttc tat cca gcg ctc aca ttg atg ctg atc acg	451
Glu Thr Arg Ala Arg Phe Tyr Pro Ala Leu Thr Leu Met Leu Ile Thr	
105 110 115	
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Gly Val Asn Gly Ala Leu Leu Thr Ala Asp Leu Phe Asn Phe Phe Val	
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ttc atc gaa gtg atg ctg ctg cct tcc tat ggt ttg atc gcc atg acc	547
Phe Ile Glu Val Met Leu Leu Pro Ser Tyr Gly Leu Ile Ala Met Thr	
135 140 145	
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Gly Thr Trp Ala Arg Leu Ala Ser Gly Arg Ile Phe Val Leu Val Asn	
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ctc tct gcc tcc aca ttg ctg gtt gca ggt gtg gga atc gtc tac ggt	643
Leu Ser Ala Ser Thr Leu Leu Val Ala Gly Val Gly Ile Val Tyr Gly	
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Val Ile Gly Ser Val Asn Ile Ala Ala Leu Gln Asp Val Val Glu Gly	
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Asn Pro Leu Val Ala Ser Ala Met Gly Ile Val Val Ile Ala Ile Ala	
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Val Lys Ala Gly Val Phe Pro Val His Thr Trp Leu Pro Arg Thr Tyr	
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Pro Gly Thr Ser Ala Ala Val Met Gly Leu Phe Ser Gly Leu His Thr	
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aaa gtc gcg gta tac atg ctc tat cgc att tgg gtc cac att ttt aac	883
Lys Val Ala Val Tyr Met Leu Tyr Arg Ile Trp Val His Ile Phe Asn	
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Met Asp Pro Thr Trp Asn Trp Leu Ile Val Ala Phe Met Val Ile Ser	
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Lys	Ala	Leu	Ile	Leu	Leu	Glu	Ile	Ala	Arg	Val	Gly	Asn	Ile	Ala	Ala	
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Trp	Ile	Ala	Ile	Ala	Ala	Ile	Ile	Ile	Ala	Ser	Leu	Gly	Ala	Leu	Leu	
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tcg	atg	atc	cgc	gtg	tgg	cgt	gaa	gtc	ttc	tgg	ggg	ggc	gca	atg	cac	1411
Ser	Met	Ile	Arg	Val	Trp	Arg	Glu	Val	Phe	Trp	Gly	Gly	Ala	Met	His	
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Gln	Arg	Gly	Val	Ser	Pro	Gln	Leu	Arg	Ile	Ser	Pro	Ala	Lys	Ile	Ala	
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Thr	Asp	Ala	Tyr	Gln	Gln	Ala	Val	Leu	Gly	Glu	Asn	Ala	Ile	Gly	Val	
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cca	agc	cct	agc	tac	cag	gga	gga	aac	taatgcttaa	cgccctgaaa						1650
Pro	Ser	Pro	Ser	Tyr	Gln	Gly	Gly	Asn								
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ttc																1653

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Phe Ile Leu Ile Met Met Ala Phe Thr Ser Asp Asp Pro Gln Arg Ala
305 310 315 320

Leu Ala Ala Gly Leu Leu Tyr Thr Leu His His Met Ile Thr Ile Ala
325 330 335

Ala Leu Val Leu Thr Ser Gly Ala Ile Glu Glu Thr Tyr Gly Thr Gly
340 345 350

Met Leu Ser Lys Leu Ser Gly Leu Ala Arg Arg Glu Pro Val Val Ala
355 360 365

Ala Val Phe Ala Ala Gly Ala Phe Ser Val Val Gly Phe Pro Pro Phe
370 375 380

Ser Gly Met Trp Gly Lys Ala Leu Ile Leu Leu Glu Ile Ala Arg Val
385 390 395 400

Gly Asn Ile Ala Ala Trp Ile Ala Ile Ala Ala Ile Ile Ile Ala Ser
405 410 415

Leu Gly Ala Leu Leu Ser Met Ile Arg Val Trp Arg Glu Val Phe Trp
420 425 430

Gly Gly Ala Met His Gln Arg Gly Val Ser Pro Gln Leu Arg Ile Ser
435 440 445

Pro Ala Lys Ile Ala Pro Ala Leu Ser Leu Ile Ile Leu Ser Val Gly
450 455 460

Met Phe Ile Phe Ala Gly Pro Leu Ile Asp Ala Thr Leu Thr Ala Thr
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[illegible]

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Pro	Leu	Ala	Ile	Arg	Asp	Val	Leu	His	Tyr	Leu	Ile	Ser	Ala	Ala	Asp	
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Leu	Lys	Asp	Pro	Val	Asn	Arg	Ser	Cys	Asp	Ile	Gly	Cys	Gly	Lys	Ser	
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Tyr	Glu	Phe	Ala	Asp	Leu	Leu	Arg	Ile	Tyr	Ala	Asp	Val	Arg	Gly	Leu	
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Lys	Arg	His	Val	Asn	Ser	Val	Pro	Leu	Asn	Leu	Pro	Met	Asp	Lys	Leu	
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Ser	Gly	Leu	Trp	Ile	Ser	Leu	Val	Thr	Pro	Val	Pro	Phe	Gln	Leu	Ser	
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Phe	Pro	Leu	Ala	Gln	Ser	Met	Ala	Glu	Asp	Ala	Val	Thr	Glu	Glu	His	
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Pro	Thr	Ser	Trp	Asp	Arg	Ser	Trp	Thr	Val	Gln	Gln	Pro	Trp	Ala	Gly	
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Gln	Pro	Thr	Asp	Pro	Glu	Trp	Ala	Gly	Lys	Ala	Val	Tyr	Glu	Asp	Val	
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Phe	Glu	Glu	Gln	Glu	Gln	Arg	Thr	Ala	Glu	Asn	Val	Ile	Gln	Ala	Ala
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 Thr Asn Gln Ile Glu Pro Leu Ala Ile Arg Asp Val Leu His Tyr Leu
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 Ile Ser Ala Ala Asp Leu Lys Asp Pro Val Asn Arg Ser Cys Asp Ile
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 Gly Cys Gly Lys Ser Tyr Glu Phe Ala Asp Leu Leu Arg Ile Tyr Ala
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 Asp Val Arg Gly Leu Lys Arg His Val Asn Ser Val Pro Leu Asn Leu
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 Pro Phe Gln Leu Ser Phe Pro Leu Ala Gln Ser Met Ala Glu Asp Ala
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 Val Thr Glu Glu His Ser Ile Lys Asp Ile Ile Ser Asp Pro Pro Asp
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 Gly Phe Ile Glu Tyr Arg Glu Ala Val Glu Leu Ala Leu Ala Ala Glu
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 Gly Pro Gly Leu Gly Gly Arg Arg Asp Pro Arg His Leu Lys Leu Gly
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Thr Thr Ala Thr Asp Leu Arg Ser Val Leu Arg Asn Val Pro Thr Pro																
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Ile Ser Phe Ile Ala Thr His Thr Asp Gln Pro Leu Gly Met Ile Val																
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Gly Ser Phe Val Ser Ile Ser Ala Glu Pro Pro Leu Val Gly Ile Phe																
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Leu Gln Lys Ser Ser Ser Ser Trp Pro Ala Ile Glu Gln Ala Leu Val																
55 60 65																
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Thr Gly Gln Glu Leu Gly Ile Ser Ile Leu Gly Gly Ala His Ala Asp																
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His Val Arg Lys Leu Ser Gly Pro Ser Asp Gln Arg Phe Glu Asn Leu																
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Gly Trp Ala Ser Thr Glu Asn Gly Ala Ile His Leu Glu Gly Ala Asp																
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Leu	Val	Leu	Gly	Gly	Ser	Gly	Gly	Val	Pro	Ser	Ala	Leu	Ile	Gln	Leu
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Ala	Arg	Ala	Leu	Thr	Gly	Leu	Lys	Val	Val	Ala	Thr	Ala	Ser	Arg	Pro
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Glu	Ser	Gln	Glu	Trp	Val	Thr	Lys	Leu	Gly	Ala	His	Glu	Val	Ile	Asp
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Thr	Arg	Ala	Met	Phe	Asn	Thr	Pro	Asp	Met	Gly	Glu	Gln	Gly	Lys	Ile
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Ala Pro Lys Pro Thr Asp Asp Gln Val Leu Val Glu Val Asp Met Ala	
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Gly Val Asn Phe Ile Asp Thr Tyr Tyr Arg Gln Gly Glu Tyr His Ala	
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Asp Pro Gln Gly Leu Ile Ala Ala Gly Thr Lys Val Ala Trp Cys Asp	
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Ala Met Gly Ser Tyr Ala Gln Gln Val Cys Val Pro Arg Asp Arg Leu	
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Val Ala Val Pro Glu Gly Val Ser Ser Glu Val Ala Ala Ser Met Leu	
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His Asn Gly Gly Arg Gly Val Asp Val Val Tyr Asp Gly Val Gly Gln	
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tcc acg ttc aat gag tcc tta gag gct gtt cgt ccg cgc ggc act gtg	787
Ser Thr Phe Asn Glu Ser Leu Glu Ala Val Arg Pro Arg Gly Thr Val	
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tgt ttg ttt ggt gcg gcg tcg ggt cct gtg gag cct ttt gat ccg cag	835
Cys Leu Phe Gly Ala Ala Ser Gly Pro Val Glu Pro Phe Asp Pro Gln	
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gcg tgg acg tct gag gag ggc gaa ttt gcc aag cgt gca cag gcg gtc 931
 Ala Trp Thr Ser Glu Glu Gly Glu Phe Ala Lys Arg Ala Gln Ala Val
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 Thr Gln Ala Ile Val Glu Gly Thr Leu Arg Val Arg Val Thr Gly Thr
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tat tgc ctt gcc gac gcc tac atc gcc cac cgc gac ctt cag gcg cgt 1027
 Tyr Ser Leu Ala Asp Ala Tyr Ile Ala His Arg Asp Leu Gln Ala Arg
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Gly Glu Tyr His Ala Arg Leu Pro Phe Ile Pro Gly Phe Glu Gly Thr
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Gly Arg Val Leu Glu Asp Pro Gln Gly Leu Ile Ala Ala Gly Thr Lys
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Val Ala Trp Cys Asp Ala Met Gly Ser Tyr Ala Gln Gln Val Cys Val
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Pro Arg Asp Arg Leu Val Ala Val Pro Glu Gly Val Ser Ser Glu Val
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Ala Ala Ser Met Leu Met Gln Gly Ile Thr Ala His Tyr Leu Thr Asn
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Gly Val Tyr Glu Leu Glu Glu Gly Asp Ser Cys Leu Ile Thr Ala Gly
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Ala Gly Gly Val Gly Leu Leu Ala Thr Gln Met Ala Ala Ala Lys Gly
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Val Arg Val Tyr Ser Val Val Ser Thr Asp Glu Lys Ala Glu Leu Ala
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 Ser Val Ile Val Val Lys Asp Pro Glu Leu Arg Lys Gly Leu Ala Gly
 90 95 100

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 Ile Thr Arg Gln Met Phe Pro His Leu Glu Gln Val Pro Ala Val Leu
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 Phe Leu Asp Ala Gly Ile Ala Ala Gln Asn Ala Ala Ile Ala Ala Glu
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 Glu Ala Val His Lys Leu Leu Gly Leu Pro Pro Glu Ile Val Pro Val
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gtg ggc ttg gaa atg ggg cat gcg gat ccg cct gaa cct gcc gga att 739
 Val Gly Leu Glu Met Gly His Ala Asp Pro Pro Glu Pro Ala Gly Ile
 200 205 210

aaa cct ccc ctg cca caa gaa gcc att gtt cac tgg gat acc tac acc 787
 Lys Pro Pro Leu Pro Gln Glu Ala Ile Val His Trp Asp Thr Tyr Thr
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gag aaa aac ctc gaa ctt atc gat tcc tac gac cgc gcc ctc gac act 835
 Glu Lys Asn Leu Glu Leu Ile Asp Ser Tyr Asp Arg Ala Leu Asp Thr
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 His Arg Ala Ala Ser Lys Ser Phe Ser Lys Thr Asn Arg Gln Phe Leu
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agg ggc gtg ttt gag cgc gcc ggg ttt ggg ctg aga taaaagcatg 977
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Gln	His 50	Arg	Ser	Val	Arg	Arg 55	Trp	Leu	Asp	Lys	Pro 60	Val	Asp	Asp	Asp
Thr 65	Ile	Arg	Thr	Ile	Ile 70	Ser	Ala	Ala	Gln	Ser 75	Ala	Gly	Thr	Ser	Ser 80
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Ala	Ile	Ala	Ala	Glu 165	Ser	Leu	Gly	Leu	Gly 170	Thr	Leu	Tyr	Leu	Gly 175	Ser
Val	Arg	Asn	Asp 180	Ala	Glu	Ala	Val	His 185	Lys	Leu	Leu	Gly	Leu 190	Pro	Pro
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Arg	Ala	Leu	Asp	Thr 245	Tyr	Tyr	Ser	Arg	Tyr 250	Gly	Gln	His	Gln	Leu 255	Trp
Ser	Lys	Gln	Thr 260	Ala	His	Arg	Ala	Ala 265	Ser	Lys	Ser	Phe	Ser 270	Lys	Thr
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Met Lys Leu Thr Leu																5
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Glu Ile Trp Arg Gln Ala Gly Pro Thr Ala Glu Gly Lys Phe Glu Thr																20
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Val Gln Val Asp Asp Ala Val Ala Gln Met Ser Ile Leu Glu Leu Leu																35
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Lys Ile Met Leu Ile Glu Ala Gly Ala Arg Arg Trp Gln Leu Ala Gly
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1 5 10 15	
ttg ggt gca tcg ccg gca cgt gta cgt tcc ggc gtg ggt tac gtg atg	96
Leu Gly Ala Ser Pro Ala Arg Val Arg Ser Gly Val Gly Tyr Val Met	
20 25 30	
gtg tcc atg gcg tca tcg atg gtg ttc ctg ttt gga ctc gca atg gtt	144
Val Ser Met Ala Ser Ser Met Val Phe Leu Phe Gly Leu Ala Met Val	
35 40 45	
tac gcc tca gtg ggc acg ttg aac atg gct cac gtt ggc cta cgc atg	192
Tyr Ala Ser Val Gly Thr Leu Asn Met Ala His Val Gly Leu Arg Met	
50 55 60	
gaa gat gtt ccg tct gga act cgc tcc gcg atc ttc gca gtg ttg ctc	240
Glu Asp Val Pro Ser Gly Thr Arg Ser Ala Ile Phe Ala Val Leu Leu	
65 70 75 80	
gtg gca ttc ggt att aaa gct gcc gtg ttc ccc cta gat tcc tgg ctg	288
Val Ala Phe Gly Ile Lys Ala Ala Val Phe Pro Leu Asp Ser Trp Leu	
85 90 95	
ccg gac tcc tac ccc acc gcg cca tcg ctg gtc acc gcg gtg ttc gca	336
Pro Asp Ser Tyr Pro Thr Ala Pro Ser Leu Val Thr Ala Val Phe Ala	
100 105 110	
ggt ctg ttg acc aag gtg ggt gtg tat tcc atc att cga gca cgc tcg	384
Gly Leu Leu Thr Lys Val Gly Val Tyr Ser Ile Ile Arg Ala Arg Ser	
115 120 125	
att att ttc acc gat gga tcc ctt gac acc atg ctg atg tgg gtg gca	432
Ile Ile Phe Thr Asp Gly Ser Leu Asp Thr Met Leu Met Trp Val Ala	

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130	135	140	
ctc gcc acc atg ctc att ggt att ttg ggc gcg atg gcg caa aac gat Leu Ala Thr Met Leu Ile Gly Ile Leu Gly Ala Met Ala Gln Asn Asp 145 150 155 160			480
atc aaa cgt ttg ttg tca ttt act ctg gtc agc cac atc ggc tac atg Ile Lys Arg Leu Leu Ser Phe Thr Leu Val Ser His Ile Gly Tyr Met 165 170 175			528
atc ttc ggc gta gcc ctt gga tct gca cag ggt ttg tct ggt gcg atc Ile Phe Gly Val Ala Leu Gly Ser Ala Gln Gly Leu Ser Gly Ala Ile 180 185 190			576
ttc tac gca atc cac cac att ctg gtt cag act tcc ctg ttc ctg gtg Phe Tyr Ala Ile His His Ile Leu Val Gln Thr Ser Leu Phe Leu Val 195 200 205			624
gtc ggt ctg gtg gaa cgc caa gcc gga tcc tcc tcg ctg cga cgc ctt Val Gly Leu Val Glu Arg Gln Ala Gly Ser Ser Ser Leu Arg Arg Leu 210 215 220			672
gga tcc ctg gca tat atc tcc cca ctt ctt gcg att ttg tac ttc atc Gly Ser Leu Ala Tyr Ile Ser Pro Leu Leu Ala Ile Leu Tyr Phe Ile 225 230 235 240			720
ccc gcc atc aac ctg ggt ggt atc cca ccg ttc tcc ggc ttc ctg ggc Pro Ala Ile Asn Leu Gly Gly Ile Pro Pro Phe Ser Gly Phe Leu Gly 245 250 255			768
aag atc atg ctc atc gaa gcc ggc gcc gaa gat ggc agt tgg ctg gca Lys Ile Met Leu Ile Glu Ala Gly Ala Glu Asp Gly Ser Trp Leu Ala 260 265 270			816
tgg gtc ctt atc gca ggc gcc gtt gtc acc tca ctg ctc acc ttg tac Trp Val Leu Ile Ala Gly Ala Val Val Thr Ser Leu Leu Thr Leu Tyr 275 280 285			864
acc atg gtt ctg gtc tgg tcc aag gcc ttc tgg cgc gac cgt aaa gac Thr Met Val Leu Val Trp Ser Lys Ala Phe Trp Arg Asp Arg Lys Asp 290 295 300			912
gcc ccc gat gga gca acc gca ctt gcg cga ccc gca cct ttg gta gat Ala Pro Asp Gly Ala Thr Ala Leu Ala Arg Pro Ala Pro Leu Val Asp 305 310 315 320			960
gtc caa gac gaa gtc gcc gtt aaa gac cgc aac gat gtc gga cgg atg Val Gln Asp Glu Val Ala Val Lys Asp Arg Asn Asp Val Gly Arg Met 325 330 335			1008
cct tgg ggc atg gtc ttc tcc act gct ctc ctg gtt tca gca tct ctt Pro Trp Gly Met Val Phe Ser Thr Ala Leu Leu Val Ser Ala Ser Leu 340 345 350			1056
gct gta tcc gtg ctc gca gga cca ctg tca tct att act gga cgc gcc Ala Val Ser Val Leu Ala Gly Pro Leu Ser Ser Ile Thr Gly Arg Ala 355 360 365			1104
gcc gaa tcc gca caa gat gtc aac atc tac cgc gcc gca gta ctc ggc Ala Glu Ser Ala Gln Asp Val Asn Ile Tyr Arg Ala Ala Val Leu Gly 370 375 380			1152

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ccc aac tac ctc gac cca tca cgc aca ctc gag atg gag cgt tac gac 1200
 Pro Asn Tyr Leu Asp Pro Ser Arg Thr Leu Glu Met Glu Arg Tyr Asp
 385 390 395 400

gcc aac cgc gat gac atc aac cac cgc gtc gac acc aac gga acg gag 1248
 Ala Asn Arg Asp Asp Ile Asn His Arg Val Asp Thr Asn Gly Thr Glu
 405 410 415

gac caa cca tgatcagtggt attcaaacga cga 1280
 Asp Gln Pro

<210> 716

<211> 419

<212> PRT

<213> Corynebacterium glutamicum

<400> 716

Tyr Val Gly Phe Glu Val Leu Leu Val Ala Ser Tyr Val Leu Leu Thr
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Leu Gly Ala Ser Pro Ala Arg Val Arg Ser Gly Val Gly Tyr Val Met
 20 25 30

Val Ser Met Ala Ser Ser Met Val Phe Leu Phe Gly Leu Ala Met Val
 35 40 45

Tyr Ala Ser Val Gly Thr Leu Asn Met Ala His Val Gly Leu Arg Met
 50 55 60

Glu Asp Val Pro Ser Gly Thr Arg Ser Ala Ile Phe Ala Val Leu Leu
 65 70 75 80

Val Ala Phe Gly Ile Lys Ala Ala Val Phe Pro Leu Asp Ser Trp Leu
 85 90 95

Pro Asp Ser Tyr Pro Thr Ala Pro Ser Leu Val Thr Ala Val Phe Ala
 100 105 110

Gly Leu Leu Thr Lys Val Gly Val Tyr Ser Ile Ile Arg Ala Arg Ser
 115 120 125

Ile Ile Phe Thr Asp Gly Ser Leu Asp Thr Met Leu Met Trp Val Ala
 130 135 140

Leu Ala Thr Met Leu Ile Gly Ile Leu Gly Ala Met Ala Gln Asn Asp
 145 150 155 160

Ile Lys Arg Leu Leu Ser Phe Thr Leu Val Ser His Ile Gly Tyr Met
 165 170 175

Ile Phe Gly Val Ala Leu Gly Ser Ala Gln Gly Leu Ser Gly Ala Ile
 180 185 190

Phe Tyr Ala Ile His His Ile Leu Val Gln Thr Ser Leu Phe Leu Val
 195 200 205

Val Gly Leu Val Glu Arg Gln Ala Gly Ser Ser Ser Leu Arg Arg Leu
 210 215 220

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Gly Ser Leu Ala Tyr Ile Ser Pro Leu Leu Ala Ile Leu Tyr Phe Ile
 225 230 235 240
 Pro Ala Ile Asn Leu Gly Gly Ile Pro Pro Phe Ser Gly Phe Leu Gly
 245 250 255
 Lys Ile Met Leu Ile Glu Ala Gly Ala Glu Asp Gly Ser Trp Leu Ala
 260 265 270
 Trp Val Leu Ile Ala Gly Ala Val Val Thr Ser Leu Leu Thr Leu Tyr
 275 280 285
 Thr Met Val Leu Val Trp Ser Lys Ala Phe Trp Arg Asp Arg Lys Asp
 290 295 300
 Ala Pro Asp Gly Ala Thr Ala Leu Ala Arg Pro Ala Pro Leu Val Asp
 305 310 315 320
 Val Gln Asp Glu Val Ala Val Lys Asp Arg Asn Asp Val Gly Arg Met
 325 330 335
 Pro Trp Gly Met Val Phe Ser Thr Ala Leu Leu Val Ser Ala Ser Leu
 340 345 350
 Ala Val Ser Val Leu Ala Gly Pro Leu Ser Ser Ile Thr Gly Arg Ala
 355 360 365
 Ala Glu Ser Ala Gln Asp Val Asn Ile Tyr Arg Ala Ala Val Leu Gly
 370 375 380
 Pro Asn Tyr Leu Asp Pro Ser Arg Thr Leu Glu Met Glu Arg Tyr Asp
 385 390 395 400
 Ala Asn Arg Asp Asp Ile Asn His Arg Val Asp Thr Asn Gly Thr Glu
 405 410 415
 Asp Gln Pro

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 <212> DNA
 <213> Corynebacterium glutamicum

<220>
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 <222> (101)..(1051)
 <223> RXN01895

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 cacaagcttt aagatccacg atcaggagac ttgacaaat atg tca gtt aac cca 115
 Met Ser Val Asn Pro
 1 5
 acc cgc ccc gaa ggc ggc cgt cac cac gtc gtc gtc atc ggt tct ggt 163
 Thr Arg Pro Glu Gly Gly Arg His His Val Val Val Ile Gly Ser Gly
 10 15 20

002290"0420950

ttt ggt ggc ctt ttt gct gcc aag aac ctg gcc aag gca gac gtc gat 211
 Phe Gly Gly Leu Phe Ala Ala Lys Asn Leu Ala Lys Ala Asp Val Asp
 25 30 35

gtc act ctg att gac cgc acc aac cac cac ctc ttc cag cca ctg ctg 259
 Val Thr Leu Ile Asp Arg Thr Asn His His Leu Phe Gln Pro Leu Leu
 40 45 50

tac caa gtg gca acc ggt atc ctc tcc tcc ggt gaa atc gca cct tcc 307
 Tyr Gln Val Ala Thr Gly Ile Leu Ser Ser Gly Glu Ile Ala Pro Ser
 55 60 65

act cga cag atc ctg ggc tcc cag gaa aac gtc aac gtc atc aag ggc 355
 Thr Arg Gln Ile Leu Gly Ser Gln Glu Asn Val Asn Val Ile Lys Gly
 70 75 80 85

gaa gtc acc gac atc aac gtc gag tcc cag act gtg acc gcc tcc ctg 403
 Glu Val Thr Asp Ile Asn Val Glu Ser Gln Thr Val Thr Ala Ser Leu
 90 95 100

ggc gag ttc acc cgc gtt ttt gag tac gat tcc ttg gtc gtt ggt gct 451
 Gly Glu Phe Thr Arg Val Phe Glu Tyr Asp Ser Leu Val Val Gly Ala
 105 110 115

ggc gca ggt cag tcc tac ttc ggc aat gat cac ttc gct gag ttc gca 499
 Gly Ala Gly Gln Ser Tyr Phe Gly Asn Asp His Phe Ala Glu Phe Ala
 120 125 130

cct ggc atg aag tcc atc gac gat gca ctg gag att cgt gca cgc atc 547
 Pro Gly Met Lys Ser Ile Asp Asp Ala Leu Glu Ile Arg Ala Arg Ile
 135 140 145

atc ggt gct ttc gag cgc gct gag atc tgc gag gat cca gct gag cgc 595
 Ile Gly Ala Phe Glu Arg Ala Glu Ile Cys Glu Asp Pro Ala Glu Arg
 150 155 160 165

gaa cgc ctg ctc acc ttc gtc gtt gtt ggc gct ggc cca acc ggt gtt 643
 Glu Arg Leu Leu Thr Phe Val Val Val Gly Ala Gly Pro Thr Gly Val
 170 175 180

gag ctt gct ggc cag ttg gct gag atg gct cac cgc acc ctt gct ggt 691
 Glu Leu Ala Gly Gln Leu Ala Glu Met Ala His Arg Thr Leu Ala Gly
 185 190 195

gag tac aag aac ttc aac acc aac tcc gca aag atc atc ctg ctt gat 739
 Glu Tyr Lys Asn Phe Asn Thr Asn Ser Ala Lys Ile Ile Leu Leu Asp
 200 205 210

ggt gct cca cag gtt ctt cct cca ttc ggt aag cgc cta ggc cgc aac 787
 Gly Ala Pro Gln Val Leu Pro Pro Phe Gly Lys Arg Leu Gly Arg Asn
 215 220 225

gca cag cgc acc ctg gaa aag atg ggt gtc aac gtt cgc ctg aac gct 835
 Ala Gln Arg Thr Leu Glu Lys Met Gly Val Asn Val Arg Leu Asn Ala
 230 235 240 245

atg gtc acc aac gtt gac gct acc tcg gtc acc tac aag acc aag gac 883
 Met Val Thr Asn Val Asp Ala Thr Ser Val Thr Tyr Lys Thr Lys Asp
 250 255 260

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atc tgc gag gat cca gct gag cgc gaa cgc ctg ctc acc ttc gtc gtt 384
 Ile Cys Glu Asp Pro Ala Glu Arg Glu Arg Leu Leu Thr Phe Val Val
 115 120 125
 gtt ggc gct ggc cca acc ggt gtt gag ctt gct ggc cag ttg gct gag 432
 Val Gly Ala Gly Pro Thr Gly Val Glu Leu Ala Gly Gln Leu Ala Glu
 130 135 140
 atg gct cac cgc acc ctt gct ggt gag tac aag aac ttc aac acc aac 480
 Met Ala His Arg Thr Leu Ala Gly Glu Tyr Lys Asn Phe Asn Thr Asn
 145 150 155 160
 tcc gca aag atc atc ctg ctt gat ggt gct cca cag gtt ctt cct cca 528
 Ser Ala Lys Ile Ile Leu Leu Asp Gly Ala Pro Gln Val Leu Pro Pro
 165 170 175
 ttc ggt aag cgc cta ggc cgc aac gca cag cgc acc ctg gaa aag atg 576
 Phe Gly Lys Arg Leu Gly Arg Asn Ala Gln Arg Thr Leu Glu Lys Met
 180 185 190
 ggt gtc aac gtt cgc ctg aac gct atg gtc acc aac gtt gac gct acc 624
 Gly Val Asn Val Arg Leu Asn Ala Met Val Thr Asn Val Asp Ala Thr
 195 200 205
 tcg gtc acc tac aag acc aag gac ggc gaa gag cac acc atc gaa tct 672
 Ser Val Thr Tyr Lys Thr Lys Asp Gly Glu Glu His Thr Ile Glu Ser
 210 215 220
 ttc tgc aag att tgg tcc gct ggt gtt gcg gca tcc cca ctg ggc aag 720
 Phe Cys Lys Ile Trp Ser Ala Gly Val Ala Ala Ser Pro Leu Gly Lys
 225 230 235 240
 ctc gtc gca gag cag acc ggt gtt gag acc gac cgc gca ggc cgc gtc 768
 Leu Val Ala Glu Gln Thr Gly Val Glu Thr Asp Arg Ala Gly Arg Val
 245 250 255
 atg gtt aac gat gac ctg tct gtt ggc gat cag aag aac gtc ttc gtt 816
 Met Val Asn Asp Asp Leu Ser Val Gly Asp Gln Lys Asn Val Phe Val
 260 265 270

<210> 720

<211> 272

<212> PRT

<213> Corynebacterium glutamicum

<400> 720

His His Leu Phe Gln Pro Leu Leu Tyr Gln Val Ala Thr Gly Ile Leu
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Ser Ser Gly Glu Ile Ala Pro Ser Thr Arg Gln Ile Leu Gly Ser Gln
 20 25 30

Glu Asn Val Asn Val Ile Lys Gly Glu Val Thr Asp Ile Asn Val Glu
 35 40 45

Ser Gln Thr Val Thr Ala Ser Leu Gly Glu Phe Thr Arg Val Phe Glu
 50 55 60

Tyr Asp Ser Leu Val Val Gly Ala Gly Ala Gly Gln Ser Tyr Phe Gly

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Asn	Asp	His	Phe	Ala	Glu	Phe	Ala	Pro	Gly	Met	Lys	Ser	Ile	Asp	Asp			
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Ala	Leu	Glu	Ile	Arg	Ala	Arg	Ile	Ile	Gly	Ala	Phe	Glu	Arg	Ala	Glu			
			100					105					110					
Ile	Cys	Glu	Asp	Pro	Ala	Glu	Arg	Glu	Arg	Leu	Leu	Thr	Phe	Val	Val			
		115					120					125						
Val	Gly	Ala	Gly	Pro	Thr	Gly	Val	Glu	Leu	Ala	Gly	Gln	Leu	Ala	Glu			
	130					135					140							
Met	Ala	His	Arg	Thr	Leu	Ala	Gly	Glu	Tyr	Lys	Asn	Phe	Asn	Thr	Asn			
145					150					155					160			
Ser	Ala	Lys	Ile	Ile	Leu	Leu	Asp	Gly	Ala	Pro	Gln	Val	Leu	Pro	Pro			
			165					170						175				
Phe	Gly	Lys	Arg	Leu	Gly	Arg	Asn	Ala	Gln	Arg	Thr	Leu	Glu	Lys	Met			
			180					185					190					
Gly	Val	Asn	Val	Arg	Leu	Asn	Ala	Met	Val	Thr	Asn	Val	Asp	Ala	Thr			
		195					200					205						
Ser	Val	Thr	Tyr	Lys	Thr	Lys	Asp	Gly	Glu	Glu	His	Thr	Ile	Glu	Ser			
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Phe	Cys	Lys	Ile	Trp	Ser	Ala	Gly	Val	Ala	Ala	Ser	Pro	Leu	Gly	Lys			
225					230				235						240			
Leu	Val	Ala	Glu	Gln	Thr	Gly	Val	Glu	Thr	Asp	Arg	Ala	Gly	Arg	Val			
			245					250					255					
Met	Val	Asn	Asp	Asp	Leu	Ser	Val	Gly	Asp	Gln	Lys	Asn	Val	Phe	Val			
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 <212> DNA
 <213> Corynebacterium glutamicum

<220>
 <221> CDS
 <222> (101)..(2386)
 <223> RXA00703

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ttctcgcatg ggttcaattg ccgggtctag actgtgacct atg aca acc cct cca 115
 Met Thr Thr Pro Pro
 1 5

act gag att tcg aac gtg aat ccc acc gcg aat gaa ttt gat gat ccg 163
 Thr Glu Ile Ser Asn Val Asn Pro Thr Ala Asn Glu Phe Asp Asp Pro

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ccc atg cca gag acc ggt ctg atg aaa ttc cgt gag ccc caa tca gtc	931
Pro Met Pro Glu Thr Gly Leu Met Lys Phe Arg Glu Pro Gln Ser Val	
265 270 275	
aag ggc gcg ttg agc att tca gac aaa ctt gct gat gaa tac ttg cag	979
Lys Gly Ala Leu Ser Ile Ser Asp Lys Leu Ala Asp Glu Tyr Leu Gln	
280 285 290	
atc cgt ctt gat gga gac cgc gca ttc ttc cag gcg ctc aac aag gaa	1027
Ile Arg Leu Asp Gly Asp Arg Ala Phe Phe Gln Ala Leu Asn Lys Glu	
295 300 305	
ctc atc cgt aga gat gcc cta gat cat gca ttc ttg gat aaa ttc tgt	1075
Leu Ile Arg Arg Asp Ala Leu Asp His Ala Phe Leu Asp Lys Phe Cys	
310 315 320 325	
tca ggt gtg gat gaa acc atc gag cac ctc aaa tca ctc gat gat gag	1123
Ser Gly Val Asp Glu Thr Ile Glu His Leu Lys Ser Leu Asp Asp Glu	
330 335 340	
gtt ctg ctc aag gga tgc ggt ctg acg gca gcg gag atc aac aag gcc	1171
Val Leu Leu Lys Gly Cys Gly Leu Thr Ala Ala Glu Ile Asn Lys Ala	
345 350 355	
gct gac atg gtg gaa aag tct gac acc gtg gtg gtg tca tgg act ctc	1219
Ala Asp Met Val Glu Lys Ser Asp Thr Val Val Val Ser Trp Thr Leu	
360 365 370	
ggg gtc acc cag cat aag aac gct gtg tac acc atc cgt gaa atg gtg	1267
Gly Val Thr Gln His Lys Asn Ala Val Tyr Thr Ile Arg Glu Met Val	
375 380 385	
aac ttc ctg ctg ctt act gga aat att ggt aag cct ggc gca ggc act	1315
Asn Phe Leu Leu Leu Thr Gly Asn Ile Gly Lys Pro Gly Ala Gly Thr	
390 395 400 405	
gcc ccg ctt cgt ggg cac tca aac gtc cag ggt gat cga acc atg ggt	1363
Ala Pro Leu Arg Gly His Ser Asn Val Gln Gly Asp Arg Thr Met Gly	
410 415 420	
att tgg gag aaa atg ccg gag gca ttc ctt gct gct ctt gaa aac gag	1411
Ile Trp Glu Lys Met Pro Glu Ala Phe Leu Ala Ala Leu Glu Asn Glu	
425 430 435	
ttt ggt ttc gat gtg ccc cgc aag cac ggc ttc gac acg gta aat tcc	1459
Phe Gly Phe Asp Val Pro Arg Lys His Gly Phe Asp Thr Val Asn Ser	
440 445 450	
ctg cga gcc atg cgc gaa ggc aag acc aag ttc ttt ctc tcc ctc ggt	1507
Leu Arg Ala Met Arg Glu Gly Lys Thr Lys Phe Phe Leu Ser Leu Gly	
455 460 465	
ggc aac ctt gtt cga gtg tcc tca gat acg tct gtt gtc gaa aag ggc	1555
Gly Asn Leu Val Arg Val Ser Ser Asp Thr Ser Val Val Glu Lys Gly	
470 475 480 485	
atg gaa tcc aat gag ctg acg gtg cat ctg tcg acc aag ccc aat ggt	1603
Met Glu Ser Asn Glu Leu Thr Val His Leu Ser Thr Lys Pro Asn Gly	
490 495 500	

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tca caa gca tgg cct ggt gag cag tca ctt atc ctt ccg gtg att gct	1651
Ser Gln Ala Trp Pro Gly Glu Gln Ser Leu Ile Leu Pro Val Ile Ala	
505 510 515	
cga aca gat aag gat gtc caa aag tca ggc gtc cag cgt gtg aca gtt	1699
Arg Thr Asp Lys Asp Val Gln Lys Ser Gly Val Gln Arg Val Thr Val	
520 525 530	
gag gat tct gcc ggc gct gtt cac gca tcc act ggt aaa cga acc gcc	1747
Glu Asp Ser Ala Gly Ala Val His Ala Ser Thr Gly Lys Arg Thr Ala	
535 540 545	
aac aag gat ctg aat ttg aag tcc gaa tgc gac atc att gga acc atc	1795
Asn Lys Asp Leu Asn Leu Lys Ser Glu Cys Asp Ile Ile Gly Thr Ile	
550 555 560 565	
ggg aag cag acc ttc ggt gat gcc ttc tgg cag ccg atg att gat aac	1843
Gly Lys Gln Thr Phe Gly Asp Ala Phe Trp Gln Pro Met Ile Asp Asn	
570 575 580	
tac gat gtg gtc cgc gat cac atc gag gcc acc att cct ggg ttc cac	1891
Tyr Asp Val Val Arg Asp His Ile Glu Ala Thr Ile Pro Gly Phe His	
585 590 595	
gat ttc aac cgt cgc atc gac aac ccc ggt gga ttc ctc ctc ccc aac	1939
Asp Phe Asn Arg Arg Ile Asp Asn Pro Gly Gly Phe Leu Leu Pro Asn	
600 605 610	
gga cct cgt gag cgc atc ttc aac aca tcc aat ggc aag gcc caa ttg	1987
Gly Pro Arg Glu Arg Ile Phe Asn Thr Ser Asn Gly Lys Ala Gln Leu	
615 620 625	
acg gtt aat gaa acc aat gtg att gag cta ccc aag gac tat ttg ctt	2035
Thr Val Asn Glu Thr Asn Val Ile Glu Leu Pro Lys Asp Tyr Leu Leu	
630 635 640 645	
atg aac acg gta cgt tca cat gat caa tac aac tcc acg att tac ggt	2083
Met Asn Thr Val Arg Ser His Asp Gln Tyr Asn Ser Thr Ile Tyr Gly	
650 655 660	
ctg gat gac cgc tac cgc ggt gtt cgc aat ggt cgc cgc gta gtg ttc	2131
Leu Asp Asp Arg Tyr Arg Gly Val Arg Asn Gly Arg Arg Val Val Phe	
665 670 675	
gtc aat cct caa gat tgt aag caa cgt ggt ctc aag gat gga gac atc	2179
Val Asn Pro Gln Asp Cys Lys Gln Arg Gly Leu Lys Asp Gly Asp Ile	
680 685 690	
gtc gat atc gtc tct gtc ttt gat gat ggc gaa cgc cga gca ccg aat	2227
Val Asp Ile Val Ser Val Phe Asp Asp Gly Glu Arg Arg Ala Pro Asn	
695 700 705	
ttc cga gtg gtg gaa tat gac acc gcg agg gac tgc gtc acc acg tat	2275
Phe Arg Val Val Glu Tyr Asp Thr Ala Arg Asp Cys Val Thr Thr Tyr	
710 715 720 725	
ttc cct gag gcc aac gta ttg gtt cca ttg gat tca gta gct gaa aaa	2323
Phe Pro Glu Ala Asn Val Leu Val Pro Leu Asp Ser Val Ala Glu Lys	
730 735 740	
tcc aac act cca gtg tcc aag tca gtt gtg gtt cgc ctt gaa gca aca	2371

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Ile Leu Ala Leu Asn Pro Met Pro Glu Thr Gly Leu Met Lys Phe Arg
 260 265 270
 Glu Pro Gln Ser Val Lys Gly Ala Leu Ser Ile Ser Asp Lys Leu Ala
 275 280 285
 Asp Glu Tyr Leu Gln Ile Arg Leu Asp Gly Asp Arg Ala Phe Phe Gln
 290 295 300
 Ala Leu Asn Lys Glu Leu Ile Arg Arg Asp Ala Leu Asp His Ala Phe
 305 310 315 320
 Leu Asp Lys Phe Cys Ser Gly Val Asp Glu Thr Ile Glu His Leu Lys
 325 330 335
 Ser Leu Asp Asp Glu Val Leu Leu Lys Gly Cys Gly Leu Thr Ala Ala
 340 345 350
 Glu Ile Asn Lys Ala Ala Asp Met Val Glu Lys Ser Asp Thr Val Val
 355 360 365
 Val Ser Trp Thr Leu Gly Val Thr Gln His Lys Asn Ala Val Tyr Thr
 370 375 380
 Ile Arg Glu Met Val Asn Phe Leu Leu Leu Thr Gly Asn Ile Gly Lys
 385 390 395 400
 Pro Gly Ala Gly Thr Ala Pro Leu Arg Gly His Ser Asn Val Gln Gly
 405 410 415
 Asp Arg Thr Met Gly Ile Trp Glu Lys Met Pro Glu Ala Phe Leu Ala
 420 425 430
 Ala Leu Glu Asn Glu Phe Gly Phe Asp Val Pro Arg Lys His Gly Phe
 435 440 445
 Asp Thr Val Asn Ser Leu Arg Ala Met Arg Glu Gly Lys Thr Lys Phe
 450 455 460
 Phe Leu Ser Leu Gly Gly Asn Leu Val Arg Val Ser Ser Asp Thr Ser
 465 470 475 480
 Val Val Glu Lys Gly Met Glu Ser Asn Glu Leu Thr Val His Leu Ser
 485 490 495
 Thr Lys Pro Asn Gly Ser Gln Ala Trp Pro Gly Glu Gln Ser Leu Ile
 500 505 510
 Leu Pro Val Ile Ala Arg Thr Asp Lys Asp Val Gln Lys Ser Gly Val
 515 520 525
 Gln Arg Val Thr Val Glu Asp Ser Ala Gly Ala Val His Ala Ser Thr
 530 535 540
 Gly Lys Arg Thr Ala Asn Lys Asp Leu Asn Leu Lys Ser Glu Cys Asp
 545 550 555 560
 Ile Ile Gly Thr Ile Gly Lys Gln Thr Phe Gly Asp Ala Phe Trp Gln
 565 570 575

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Pro Met Ile Asp Asn Tyr Asp Val Val Arg Asp His Ile Glu Ala Thr
580 585 590

Ile Pro Gly Phe His Asp Phe Asn Arg Arg Ile Asp Asn Pro Gly Gly
595 600 605

Phe Leu Leu Pro Asn Gly Pro Arg Glu Arg Ile Phe Asn Thr Ser Asn
610 615 620

Gly Lys Ala Gln Leu Thr Val Asn Glu Thr Asn Val Ile Glu Leu Pro
625 630 635 640

Lys Asp Tyr Leu Leu Met Asn Thr Val Arg Ser His Asp Gln Tyr Asn
645 650 655

Ser Thr Ile Tyr Gly Leu Asp Asp Arg Tyr Arg Gly Val Arg Asn Gly
660 665 670

Arg Arg Val Val Phe Val Asn Pro Gln Asp Cys Lys Gln Arg Gly Leu
675 680 685

Lys Asp Gly Asp Ile Val Asp Ile Val Ser Val Phe Asp Asp Gly Glu
690 695 700

Arg Arg Ala Pro Asn Phe Arg Val Val Glu Tyr Asp Thr Ala Arg Asp
705 710 715 720

Cys Val Thr Thr Tyr Phe Pro Glu Ala Asn Val Leu Val Pro Leu Asp
725 730 735

Ser Val Ala Glu Lys Ser Asn Thr Pro Val Ser Lys Ser Val Val Val
740 745 750

Arg Leu Glu Ala Thr Gly Arg Thr Ala Ser
755 760

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<222> (101)..(1015)
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Met Gly Arg Ile Thr
1 5
caa aac ttg cag gtc cca cgc gtt gtg tcc act gac gag caa gtt ttt 163
Gln Asn Leu Gln Val Pro Arg Val Val Ser Thr Asp Glu Gln Val Phe
10 15 20
gtt aac act cgt ccg gat act gtt gcg gtg gag gag cct cta gaa att 211
Val Asn Thr Arg Pro Asp Thr Val Ala Val Glu Glu Pro Leu Glu Ile
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Arg	Thr	Pro	Gly	His	Asp	Ile	Glu	Leu	Val	His	Gly	Leu	Leu	Leu	Ser	
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Glu	Gly	Leu	Ile	Thr	Asp	Ala	Ser	Glu	Val	Phe	Thr	Ala	Arg	Tyr	Cys	
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Ala	Gly	Ala	Val	Gly	Pro	Asp	Asn	Gln	Asn	Thr	Tyr	Asn	Val	Leu	Glu	
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Leu	Asp	Val	Ile	Pro	Lys	Asp	Asn	Pro	Ala	Arg	Asp	Pro	Val	Gln	Asn	
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Pro	Ser	His	Asn	Pro	Glu	Gly	Ser	Gln	His	Glu	Ala	Leu	His	Ile	Pro	
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Gln	Leu	Met	Asn	Lys	Lys	Gly	Trp	Pro	Ile	Thr	Pro	Ile	Thr	Pro	Asp	
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Pro	Arg	Met	Ile	Val	Ser	Leu	Pro	Asp	Lys	Leu	Lys	Ser	Lys	Gln	Lys	
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Ile	Phe	Asp	Lys	Thr	Gly	Gly	Val	His	Ala	Ala	Gly	Leu	Ala	Thr	Leu	
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Ala	Asp	Lys	Val	Ile	Gly	Asn	Met	Leu	Met	Ala	Gly	Lys	Leu	Pro	Leu	
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Asp	Thr	Val	Ala	Val	Glu	Glu	Pro	Leu	Glu	Ile	Arg	Val	Asn	Gly	Thr	
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gcg	ctt	acc	acc	act	atg	cgc	acg	ccc	ggc	cat	gat	att	gag	ttg	gtg	144
Ala	Leu	Thr	Thr	Thr	Met	Arg	Thr	Pro	Gly	His	Asp	Ile	Glu	Leu	Val	
		35			40						45					
cat	ggc	ctc	ctc	ttg	tca	gaa	ggt	ctg	atc	acg	gat	gct	tct	gag	gtt	192
His	Gly	Leu	Leu	Leu	Ser	Glu	Gly	Leu	Ile	Thr	Asp	Ala	Ser	Glu	Val	
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Phe	Thr	Ala	Arg	Tyr	Cys	Ala	Gly	Ala	Val	Gly	Pro	Asp	Asn	Gln	Asn	
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Thr	Tyr	Asn	Val	Leu	Glu	Leu	Asp	Val	Ile	Pro	Lys	Asp	Asn	Pro	Ala	
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cgg	gat	ccc	gtc	cag	aat	ccc	tcc	cat	aat	ccc	gaa	ggc	agc	caa	cac	336
Arg	Asp	Pro	Val	Gln	Asn	Pro	Ser	His	Asn	Pro	Glu	Gly	Ser	Gln	His	
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gaa	gca	ctc	cac	atc	cca	act	ttc	caa	ccg	gta	cgc	gaa	cta	aac	ctc	384
Glu	Ala	Leu	His	Ile	Pro	Thr	Phe	Gln	Pro	Val	Arg	Glu	Leu	Asn	Leu	
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Phe Thr Ala Arg Tyr Cys Ala Gly Ala Val Gly Pro Asp Asn Gln Asn
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 Arg Asp Pro Val Gln Asn Pro Ser His Asn Pro Glu Gly Ser Gln His
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 Glu Ala Leu His Ile Pro Thr Phe Gln Pro Val Arg Glu Leu Asn Leu
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 Val Ala Ala Gln Arg Asn Val Leu Thr Thr Ser Ala Cys Gly Val Cys
 130 135 140
 Gly Thr Thr Ser Ile Glu Gln Leu Met Asn Lys Lys Gly Trp Pro Ile
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 Thr Pro Ile Thr Pro Asp Pro Arg Met Ile Val Ser Leu Pro Asp Lys
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 Leu Lys Ser Lys Gln Lys Ile Phe Asp Lys Thr Gly Gly Val His Ala
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 Ala Gly Leu Ala Thr Leu Asp Gly Glu Met Leu Ile Ile Arg Glu Asp
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 Val Gly Arg His Asn Ala Ala Asp Lys Val Ile Gly Asn Met Leu Met
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 Ala Gly Lys Leu Pro Leu Glu Asn Thr Ile Leu Val Met Ser Ser Arg
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 Ala Ser Phe Glu Leu Val Gln Lys Ala Ala Met Ala Gly Ile Ser Gly
 245 250 255
 Val Ile Ala Val Gly Ala Ala Thr Ser Leu Ala Ile Glu Ala Ala Gln
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<212> DNA

<213> Corynebacterium glutamicum

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<222> (101)..(1111)

<223> RXN00388

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Gln	Thr	Tyr	Ala	Gln	Phe	Ser	Asp	Thr	Ala	Phe	Val	Ser	Ala	Tyr	Ile	
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Ile	Tyr	Val	Leu	Ala	Leu	Ile	Leu	Ser	Leu	Val	Tyr	Tyr	Val	Lys	Gln	
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caa	ggc	att	atc	gac	gcc	cgc	cgc	gag	caa	acc	cgc	gtc	agc	gaa	ctc	259
Gln	Gly	Ile	Ile	Asp	Ala	Arg	Arg	Glu	Gln	Thr	Arg	Val	Ser	Glu	Leu	
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Val	Gly	Ala	Gly	Gly	Ser	Ala	Asp	Val	Asp	Thr	Asp	Leu	Pro	Asp	Asp	
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Val	Met	Val	His	Leu	Val	Ser	Val	Val	Met	Arg	Ala	Leu	Ser	Ala	Ser	
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Arg	Phe	Pro	Phe	Gly	Asn	Leu	Tyr	Glu	Tyr	Ile	Leu	Met	Val	Thr	Leu	
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ttc	gcc	atg	atc	gga	gcc	gta	ctc	atc	ctg	cag	cgc	cca	caa	ttc	cgc	547
Phe	Ala	Met	Ile	Gly	Ala	Val	Leu	Ile	Leu	Gln	Arg	Pro	Gln	Phe	Arg	
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Val	Val	Trp	Pro	Trp	Ile	Leu	Thr	Pro	Met	Leu	Ala	Leu	Leu	Phe	Tyr	
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Gly	Gly	Thr	Gln	Leu	Tyr	Ser	Asp	Ala	Ala	Pro	Val	Val	Pro	Ala	Leu	
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cag	tcc	ttc	tgg	ttc	cgc	atc	cac	gtt	tcc	tcc	gtc	tcc	atc	ggc	gca	691
Gln	Ser	Phe	Trp	Phe	Pro	Ile	His	Val	Ser	Ser	Val	Ser	Ile	Gly	Ala	
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tcc	atc	ggg	atc	gtc	tcc	ggg	att	gca	tcc	ctg	ctg	tac	ata	ctg	cgc	739
Ser	Ile	Gly	Ile	Val	Ser	Gly	Ile	Ala	Ser	Leu	Leu	Tyr	Ile	Leu	Arg	
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Met	Trp	Gln	Pro	Lys	Gly	Lys	Glu	Lys	Gly	Phe	Phe	Gly	Ala	Val	Ala	
				215					220					225		
aaa	cca	ctc	cca	tcc	gga	aaa	acc	ctg	gat	aac	ctg	gca	tac	aag	acc	835
Lys	Pro	Leu	Pro	Ser	Gly	Lys	Thr	Leu								

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 Ile Trp Ala Glu Ala Ala Trp Gly Arg Phe Trp Gly Trp Asp Pro Lys
 265 270 275

gaa aca gtc tcc ttc atc acc tgg gtt ctc tac gct ggt tac ctc cac 979
 Glu Thr Val Ser Phe Ile Thr Trp Val Leu Tyr Ala Gly Tyr Leu His
 280 285 290

gca cgt gca act gct ggt tgg cgc aac acc aac gct gca tgg atc aac 1027
 Ala Arg Ala Thr Ala Gly Trp Arg Asn Thr Asn Ala Ala Trp Ile Asn
 295 300 305

atc ctg gcg ctg gtc acg atg att ttt aat ctg ttc ttc atc aac atg 1075
 Ile Leu Ala Leu Val Thr Met Ile Phe Asn Leu Phe Phe Ile Asn Met
 310 315 320 325

gtc gta tct ggt ctg cac tct tac gcc gga ctg aac taagcacttt 1121
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 Tyr Tyr Val Lys Gln Gln Gly Ile Ile Asp Ala Arg Arg Glu Gln Thr
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 Arg Val Ser Glu Leu Val Gly Ala Gly Gly Ser Ala Asp Val Asp Thr
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 Asp Leu Pro Asp Asp Ile Ala Asp Gly Val Leu Ala Asp Glu Asp Leu
 65 70 75 80
 Ala Lys Arg Glu Glu Thr Ala Arg Lys Leu Ala Asn Met Thr Gln Ser
 85 90 95
 Leu Met Trp Leu Gly Val Met Val His Leu Val Ser Val Val Met Arg
 100 105 110
 Ala Leu Ser Ala Ser Arg Phe Pro Phe Gly Asn Leu Tyr Glu Tyr Ile
 115 120 125
 Leu Met Val Thr Leu Phe Ala Met Ile Gly Ala Val Leu Ile Leu Gln
 130 135 140

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Arg Pro Gln Phe Arg Val Val Trp Pro Trp Ile Leu Thr Pro Met Leu
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 Ala Leu Leu Phe Tyr Gly Gly Thr Gln Leu Tyr Ser Asp Ala Ala Pro
 165 170 175
 Val Val Pro Ala Leu Gln Ser Phe Trp Phe Pro Ile His Val Ser Ser
 180 185 190
 Val Ser Ile Gly Ala Ser Ile Gly Ile Val Ser Gly Ile Ala Ser Leu
 195 200 205
 Leu Tyr Ile Leu Arg Met Trp Gln Pro Lys Gly Lys Glu Lys Gly Phe
 210 215 220
 Phe Gly Ala Val Ala Lys Pro Leu Pro Ser Gly Lys Thr Leu Asp Asn
 225 230 235 240
 Leu Ala Tyr Lys Thr Ala Ile Trp Thr Val Pro Ile Phe Gly Leu Gly
 245 250 255
 Ile Ile Leu Gly Ala Ile Trp Ala Glu Ala Ala Trp Gly Arg Phe Trp
 260 265 270
 Gly Trp Asp Pro Lys Glu Thr Val Ser Phe Ile Thr Trp Val Leu Tyr
 275 280 285
 Ala Gly Tyr Leu His Ala Arg Ala Thr Ala Gly Trp Arg Asn Thr Asn
 290 295 300
 Ala Ala Trp Ile Asn Ile Leu Ala Leu Val Thr Met Ile Phe Asn Leu
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 325 330 335
 Asn

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 Phe Gly Leu Gly Ile Ile Leu Gly Ala Ile Trp Ala Glu Ala Ala Trp
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 Arg Val Ser Glu Leu Val Gly Ala Gly Gly Ser Ala Asp Val Asp Thr
 50 55 60
 Asp Leu Pro Asp Asp Ile Ala Asp Gly Val Leu Ala Asp Glu Asp Leu
 65 70 75 80
 Ala Lys Arg Glu Glu Thr Ala Arg Lys Leu Ala Asn Met Thr Gln Ser
 85 90 95
 Leu Met Trp Leu Gly Val Met Val His Leu Val Ser Val Val Met Arg
 100 105 110
 Ala Leu Ser Ala Ser Arg Phe Pro Phe Gly Asn Leu Tyr Glu Tyr Ile
 115 120 125
 Leu Met Val Thr Leu Phe Ala Met Ile Gly Ala Val Leu Ile Leu Gln
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 Gly Thr Trp Phe Ser Thr Val Ala Pro Ser
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 Met Leu Glu Arg Leu
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 aaa cgc cta gat ccg ctc att gtc ctc att gtg ctg gct gtc att gtg 163
 Lys Arg Leu Asp Pro Leu Ile Val Leu Ile Val Leu Ala Val Ile Val
 10 15 20
 gcg atc atc att cca gtt cgc ggg gtt gct gcg gat tgg ttt gat gtc 211
 Ala Ile Ile Ile Pro Val Arg Gly Val Ala Ala Asp Trp Phe Asp Val
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 Ala Val Lys Ile Ala Ile Ala Leu Leu Phe Phe Leu Tyr Gly Ala Arg
 40 45 50
 cta tcc acc caa gag gcg ctg aat ggt ctg aag cac tgg agg ctt cac 307
 Leu Ser Thr Gln Glu Ala Leu Asn Gly Leu Lys His Trp Arg Leu His
 55 60 65

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Ala Thr Gly Leu Pro Met	Ala Ala Val Ile Phe Gly Gly	Ala Asn Ile
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Gly Leu Leu Ile Leu Pro	Leu Met Ile Phe His	Gln Val Gln Leu Met
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Lys Ala Asn Ala		

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 Leu Ile Val Ser Thr
 1 5
 cag ccc att act gat cgc agc gca ctc tcg gca gaa cac gca gag gtg 163
 Gln Pro Ile Thr Asp Arg Ser Ala Leu Ser Ala Glu His Ala Glu Val
 10 15 20
 atc aaa gca acg ctt cct ctc gtg ggc ggc aag att aat gag atc acg 211
 Ile Lys Ala Thr Leu Pro Leu Val Gly Gly Lys Ile Asn Glu Ile Thr
 25 30 35
 ccg gtt ttc tac aac aag atg ttt gcg gct cac cca gaa ttg atc gct 259
 Pro Val Phe Tyr Asn Lys Met Phe Ala Ala His Pro Glu Leu Ile Ala
 40 45 50
 aac acc ttc aac cgt ggc aat cag aag caa ggc gat cag cag aag gcg 307
 Asn Thr Phe Asn Arg Gly Asn Gln Lys Gln Gly Asp Gln Gln Lys Ala
 55 60 65
 ctg gcg gct tcg att gca acg ttt gcc acc atg ctc gtt act cct gat 355
 Leu Ala Ala Ser Ile Ala Thr Phe Ala Thr Met Leu Val Thr Pro Asp
 70 75 80 85
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 Ala Pro Asp Pro Val Gln Leu Leu Ser Arg Ile Gly His Lys His Val
 90 95 100
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 Ser Leu Gly Ile Thr Ala Asp Gln Tyr Asp Ile Val His Glu His Leu
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Val	Ala	Glu	Ala	Trp	Asp	Ala	Val	Tyr	Trp	Ile	Met	Ala	Asn	Val	Leu		
		135					140				145						
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Thr	Val	Trp	Glu	Tyr	Thr	Leu	Ala	Gly	Glu	Leu	Val	Ala	Pro	Glu	Pro		
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ctg	cgc	cag	tac	agc	ttg	ctc	ggc	ggc	tcc	gac	acc	gag	tac	cgc	att	787	
Leu	Arg	Gln	Tyr	Ser	Leu	Leu	Gly	Gly	Ser	Asp	Thr	Glu	Tyr	Arg	Ile		
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gcg	gtt	gag	gat	aac	ggc	gag	gtt	tct	gga	ttc	ctg	cgt	gat	cgc	gta	835	
Ala	Val	Glu	Asp	Asn	Gly	Glu	Val	Ser	Gly	Phe	Leu	Arg	Asp	Arg	Val		
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Ser	Val	Gly	Asp	Lys	Ile	Glu	Ala	Thr	Ile	Ala	Ala	Gly	Asp	Leu	Val		
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ctt	aac	aag	gac	acc	aat	cca	gtt	gtg	ctg	att	tcc	cag	ggc	atc	ggc	931	
Leu	Asn	Lys	Asp	Thr	Asn	Pro	Val	Val	Leu	Ile	Ser	Gln	Gly	Ile	Gly		
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tcc	acc	cca	atg	gtg	ggc	atg	ctc	gca	ggc	atg	aac	cct	gaa	cgt	gac	979	
Ser	Thr	Pro	Met	Val	Gly	Met	Leu	Ala	Gly	Met	Asn	Pro	Glu	Arg	Asp		
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Glu	Glu	Val	Gln	Gly	Leu	Val	Glu	Lys	Leu	Pro	Lys	Ala	Ala	Phe	Glu		
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atc	ttc	tac	cgc	gac	aac	gac	cag	tgg	ctc	gag	gtc	gct	ggc	cgc	att	1123	
Ile	Phe	Tyr	Arg	Asp	Asn	Asp	Gln	Trp	Leu	Glu	Val	Ala	Gly	Arg	Ile		
						330					335				340		
cca	tca	ggc	gcg	tcc	gtg	tac	ctg	tgc	ggc	gtg	gaa	ttc	ttg	aag		1171	
Pro	Ser	Gly	Ala	Ser	Val	Tyr	Leu	Cys	Gly	Gly	Val	Glu	Phe	Leu	Lys		
						345						355					
aac	gtg	cgt	gag	cag	atc	gag	gcg	ctc	gat	gag	cag	cct	cgc	gac	gta	1219	
Asn	Val	Arg	Glu	Gln	Ile	Glu	Ala	Leu	Asp	Glu	Gln	Pro	Arg	Asp	Val		

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				245				250				255			
Ala	Gly	Asp	Leu	Val	Leu	Asn	Lys	Asp	Thr	Asn	Pro	Val	Val	Leu	Ile
			260					265					270		
Ser	Gln	Gly	Ile	Gly	Ser	Thr	Pro	Met	Val	Gly	Met	Leu	Ala	Gly	Met
		275					280					285			
Asn	Pro	Glu	Arg	Asp	Val	Val	Val	Leu	His	Ala	Asp	Gln	Ala	Glu	Ser
	290					295					300				
Thr	Tyr	Ala	Gln	Val	Glu	Glu	Val	Gln	Gly	Leu	Val	Glu	Lys	Leu	Pro
305					310					315					320
Lys	Ala	Ala	Phe	Glu	Ile	Phe	Tyr	Arg	Asp	Asn	Asp	Gln	Trp	Leu	Glu
				325					330					335	
Val	Ala	Gly	Arg	Ile	Pro	Ser	Gly	Ala	Ser	Val	Tyr	Leu	Cys	Gly	Gly
			340					345					350		
Val	Glu	Phe	Leu	Lys	Asn	Val	Arg	Glu	Gln	Ile	Glu	Ala	Leu	Asp	Glu
		355					360					365			
Gln	Pro	Arg	Asp	Val	Asn	Phe	Glu	Leu	Phe	Ala	Pro	Asn	Asp	Trp	Leu
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Ile	Ser														
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<213> Corynebacterium glutamicum
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<223> FRXA02556
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 Leu Ile Val Ser Thr
 1 5

cag ccc att act gat cgc agc gca ctc tcg gca gaa cac gca gag gtg 163
Gln Pro Ile Thr Asp Arg Ser Ala Leu Ser Ala Glu His Ala Glu Val
10 15 20

atc aaa gca acg ctt cct ctc gtg ggc ggc aag att aat gag atc acg 211
Ile Lys Ala Thr Leu Pro Leu Val Gly Gly Lys Ile Asn Glu Ile Thr
25 30 35

cgc gtt ttc tac aac aag atg ttt gcg gct cac cca gaa ttg atc gct 259
Pro Val Phe Tyr Asn Lys Met Phe Ala Ala His Pro Glu Leu Ile Ala
40 45 50

aac acc ttc aac ggt ggc aat cag aag caa ggc gat cag cag aag gcg 307
Asn Thr Phe Asn Gly Gly Asn Gln Lys Gln Gly Asp Gln Gln Lys Ala

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ctg gcg gct tcg att gca acg ttt gcc acc atg ctc gtt act cct gat			355
Leu Ala Ala Ser Ile Ala Thr Phe Ala Thr Met Leu Val Thr Pro Asp			
70	75	80	85
gct cct gac cca gtt cag ctg ctg tcc cgc att ggc cac aag cac gtg			403
Ala Pro Asp Pro Val Gln Leu Leu Ser Arg Ile Gly His Lys His Val			
	90	95	100
tcc ctc ggc att act gct gat cag tac gac att gtt cac gag cac ctg			451
Ser Leu Gly Ile Thr Ala Asp Gln Tyr Asp Ile Val His Glu His Leu			
	105	110	115
ttc gcc gca atc gtt gag gtt ttg gga gcg gaa act gtc acc gca cct			499
Phe Ala Ala Ile Val Glu Val Leu Gly Ala Glu Thr Val Thr Ala Pro			
	120	125	130
gtc gct gaa gcc tgg gat gct gtc tac tgg atc atg gca aat gtg ctg			547
Val Ala Glu Ala Trp Asp Ala Val Tyr Trp Ile Met Ala Asn Val Leu			
	135	140	145
atc ggt ttt gag aac aac ctt tat gct tcc aac gat ctg gag cct ggc			595
Ile Gly Phe Glu Asn Asn Leu Tyr Ala Ser Asn Asp Leu Glu Pro Gly			
	150	155	160
gac gtc ttc cgc gaa gtc acc gtg acc gcg aag aag cag ctc agc gca			643
Asp Val Phe Arg Glu Val Thr Val Thr Ala Lys Lys Gln Leu Ser Ala			
	170	175	180
acc gtc tgg gaa tac acc ctg gca ggt gag ctg gtt gcc cca gag cca			691
Thr Val Trp Glu Tyr Thr Leu Ala Gly Glu Leu Val Ala Pro Glu Pro			
	185	190	195
ggt cag tac acc tcc atc gga gta gtg ctt gac gac ggc gcc cgc cag			739
Gly Gln Tyr Thr Ser Ile Gly Val Val Leu Asp Asp Gly Ala Arg Gln			
	200	205	210
ctg cgc cag tac agc ttg ctc ggc ggc tcc gac acc gag tac cgc att			787
Leu Arg Gln Tyr Ser Leu Leu Gly Gly Ser Asp Thr Glu Tyr Arg Ile			
	215	220	225
gcg gtt gag gat aac ggc gag gtt tct gga ttc ctg cgt gat cgc gta			835
Ala Val Glu Asp Asn Gly Glu Val Ser Gly Phe Leu Arg Asp Arg Val			
	230	235	240
tcc gtt ggt gac aag att gaa gcc acc atc gcg gcc ggc gac ctg gtt			883
Ser Val Gly Asp Lys Ile Glu Ala Thr Ile Ala Ala Gly Asp Leu Val			
	250	255	260
ctt aac aag gac acc aat cca gtt gtg ctg att tcc cag ggc atc ggc			931
Leu Asn Lys Asp Thr Asn Pro Val Val Leu Ile Ser Gln Gly Ile Gly			
	265	270	275
tcc acc cca atg gtg ggc atg ctc gca ggt atg aac cct gaa cgt gac			979
Ser Thr Pro Met Val Gly Met Leu Ala Gly Met Asn Pro Glu Arg Asp			
	280	285	290
gtt gtg gtt ttg cat gct gac cag gcc gag tcc acc tac gcg cag gtg			1027
Val Val Val Leu His Ala Asp Gln Ala Glu Ser Thr Tyr Ala Gln Val			
	295	300	305

002290 0420960

gag gaa gtg cag ggg ctc gtc gaa aag ctc cct aag gct gcg ttt gaa 1075
 Glu Glu Val Gln Gly Leu Val Glu Lys Leu Pro Lys Ala Ala Phe Glu
 310 315 320 325

atc ttc tac cgc gac aac gac cag tgg ctc gag gtc gct ggc cgc att 1123
 Ile Phe Tyr Arg Asp Asn Asp Gln Trp Leu Glu Val Ala Gly Arg Ile
 330 335 340

cca tca ggt gcg tcc gtg tac ctg tgc ggt ggc gtg gaa ttc ttg aag 1171
 Pro Ser Gly Ala Ser Val Tyr Leu Cys Gly Gly Val Glu Phe Leu Lys
 345 350 355

aac gtg cgt gag cag atc gag gcg ctc gat gag cag cct cgc gac gta 1219
 Asn Val Arg Glu Gln Ile Glu Ala Leu Asp Glu Gln Pro Arg Asp Val
 360 365 370

aac ttc gag ctc ttc gca cca aac gac tgg ctg att tcc taagcccaca 1268
 Asn Phe Glu Leu Phe Ala Pro Asn Asp Trp Leu Ile Ser
 375 380 385

ccccagaact tcc 1281

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<211> 386

<212> PRT

<213> Corynebacterium glutamicum

<400> 738

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 20 25 30

Ile Asn Glu Ile Thr Pro Val Phe Tyr Asn Lys Met Phe Ala Ala His
 35 40 45

Pro Glu Leu Ile Ala Asn Thr Phe Asn Gly Gly Asn Gln Lys Gln Gly
 50 55 60

Asp Gln Gln Lys Ala Leu Ala Ala Ser Ile Ala Thr Phe Ala Thr Met
 65 70 75 80

Leu Val Thr Pro Asp Ala Pro Asp Pro Val Gln Leu Leu Ser Arg Ile
 85 90 95

Gly His Lys His Val Ser Leu Gly Ile Thr Ala Asp Gln Tyr Asp Ile
 100 105 110

Val His Glu His Leu Phe Ala Ala Ile Val Glu Val Leu Gly Ala Glu
 115 120 125

Thr Val Thr Ala Pro Val Ala Glu Ala Trp Asp Ala Val Tyr Trp Ile
 130 135 140

Met Ala Asn Val Leu Ile Gly Phe Glu Asn Asn Leu Tyr Ala Ser Asn
 145 150 155 160

Asp Leu Glu Pro Gly Asp Val Phe Arg Glu Val Thr Val Thr Ala Lys

002290-0720960

165 170 175
 Lys Gln Leu Ser Ala Thr Val Trp Glu Tyr Thr Leu Ala Gly Glu Leu
 180 185 190
 Val Ala Pro Glu Pro Gly Gln Tyr Thr Ser Ile Gly Val Val Leu Asp
 195 200 205
 Asp Gly Ala Arg Gln Leu Arg Gln Tyr Ser Leu Leu Gly Gly Ser Asp
 210 215 220
 Thr Glu Tyr Arg Ile Ala Val Glu Asp Asn Gly Glu Val Ser Gly Phe
 225 230 235 240
 Leu Arg Asp Arg Val Ser Val Gly Asp Lys Ile Glu Ala Thr Ile Ala
 245 250 255
 Ala Gly Asp Leu Val Leu Asn Lys Asp Thr Asn Pro Val Val Leu Ile
 260 265 270
 Ser Gln Gly Ile Gly Ser Thr Pro Met Val Gly Met Leu Ala Gly Met
 275 280 285
 Asn Pro Glu Arg Asp Val Val Val Leu His Ala Asp Gln Ala Glu Ser
 290 295 300
 Thr Tyr Ala Gln Val Glu Glu Val Gln Gly Leu Val Glu Lys Leu Pro
 305 310 315 320
 Lys Ala Ala Phe Glu Ile Phe Tyr Arg Asp Asn Asp Gln Trp Leu Glu
 325 330 335
 Val Ala Gly Arg Ile Pro Ser Gly Ala Ser Val Tyr Leu Cys Gly Gly
 340 345 350
 Val Glu Phe Leu Lys Asn Val Arg Glu Gln Ile Glu Ala Leu Asp Glu
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 Gln Pro Arg Asp Val Asn Phe Glu Leu Phe Ala Pro Asn Asp Trp Leu
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 Ile Ser
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ttgacatatc atctaaattt ccaagagagg acaccacaca gtg gct aac acg tca 115
 Val Ala Asn Thr Ser
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002290" 0420960


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<210> 741
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 aag gtt cgt gag ctc acc gat ggt ttc ggc acc gat gtc tcc atc gat 883
 Lys Val Arg Glu Leu Thr Asp Gly Phe Gly Thr Asp Val Ser Ile Asp
 250 255 260
 gcg gta ggc atc atg ccg acc tgg cag cag gcg ttt tac tcc cgt gac 931
 Ala Val Gly Ile Met Pro Thr Trp Gln Gln Ala Phe Tyr Ser Arg Asp
 265 270 275
 cat gca ggc cgc atg gtg atg gtg ggc gtt cca aac ctg acg tct cgc 979
 His Ala Gly Arg Met Val Met Val Gly Val Pro Asn Leu Thr Ser Arg
 280 285 290
 gta gat gtt cct gcg att gat ttt tac ggt cgc ggt gga tcc gtg cgc 1027
 Val Asp Val Pro Ala Ile Asp Phe Tyr Gly Arg Gly Gly Ser Val Arg
 295 300 305
 cct gca tgg tac ggc gac tgc ctg cct gag cgt gat ttc cca act tat 1075
 Pro Ala Trp Tyr Gly Asp Cys Leu Pro Glu Arg Asp Phe Pro Thr Tyr
 310 315 320 325
 gtg gat ctg cac ctg cag ggt cgt ttc cca ctg gat aag ttt gtt tct 1123
 Val Asp Leu His Leu Gln Gly Arg Phe Pro Leu Asp Lys Phe Val Ser
 330 335 340
 gag cgt att ggt ctt gat gat gtt gaa gag gct ttc aac acc atg aag 1171
 Glu Arg Ile Gly Leu Asp Asp Val Glu Glu Ala Phe Asn Thr Met Lys
 345 350 355
 gct ggc gac gtg ctg cgt tct gtg gtg gag atc taaatggctc acgacggatt 1224
 Ala Gly Asp Val Leu Arg Ser Val Val Glu Ile
 360 365
 gcg 1227
 <210> 742
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 <212> PRT
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 <400> 742
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 Ile Val Lys Ile Gln Ala Cys Gly Val Cys His Thr Asp Leu Ala Tyr
 35 40 45
 Arg Asp Gly Asp Ile Ser Asp Glu Phe Pro Tyr Leu Leu Gly His Glu
 50 55 60
 Ala Ala Gly Ile Val Glu Glu Val Gly Glu Ser Val Thr His Val Glu
 65 70 75 80
 Val Gly Asp Phe Val Ile Leu Asn Trp Arg Ala Val Cys Gly Glu Cys
 85 90 95

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Arg Ala Cys Lys Lys Gly Glu Pro Lys Tyr Cys Phe Asn Thr His Asn
 100 105 110
 Ala Ser Lys Lys Met Thr Leu Glu Asp Gly Thr Glu Leu Ser Pro Ala
 115 120 125
 Leu Gly Ile Gly Ala Phe Leu Glu Lys Thr Leu Val His Glu Gly Gln
 130 135 140
 Cys Thr Lys Val Asn Pro Glu Glu Asp Pro Ala Ala Ala Gly Leu Leu
 145 150 155 160
 Gly Cys Gly Ile Met Ala Gly Leu Gly Ala Ala Val Asn Thr Gly Asp
 165 170 175
 Ile Lys Arg Gly Glu Ser Val Ala Val Phe Gly Leu Gly Gly Val Gly
 180 185 190
 Met Ala Ala Ile Ala Gly Ala Lys Ile Ala Gly Ala Ser Lys Ile Ile
 195 200 205
 Ala Val Asp Ile Asp Glu Lys Lys Leu Glu Trp Ala Lys Glu Phe Gly
 210 215 220
 Ala Thr His Thr Ile Asn Ser Ser Gly Leu Gly Gly Glu Gly Asp Ala
 225 230 235 240
 Ser Glu Val Val Ala Lys Val Arg Glu Leu Thr Asp Gly Phe Gly Thr
 245 250 255
 Asp Val Ser Ile Asp Ala Val Gly Ile Met Pro Thr Trp Gln Gln Ala
 260 265 270
 Phe Tyr Ser Arg Asp His Ala Gly Arg Met Val Met Val Gly Val Pro
 275 280 285
 Asn Leu Thr Ser Arg Val Asp Val Pro Ala Ile Asp Phe Tyr Gly Arg
 290 295 300
 Gly Gly Ser Val Arg Pro Ala Trp Tyr Gly Asp Cys Leu Pro Glu Arg
 305 310 315 320
 Asp Phe Pro Thr Tyr Val Asp Leu His Leu Gln Gly Arg Phe Pro Leu
 325 330 335
 Asp Lys Phe Val Ser Glu Arg Ile Gly Leu Asp Asp Val Glu Glu Ala
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<211> 1011

<212> DNA

<213> Corynebacterium glutamicum

002290.0420960

Ala Met Trp Ile Gly Ser Arg Ser
290 295

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tcc act gcc ctg ttg gtt tcc gca tcc ctt gct gta tcc gtg ctc gca 307

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<223> RXN02036

<400> 747

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gccctcatct ctgctgcagt ggcggctctc ggagggtggt gtg cat att cct ttt 115
                               Val His Ile Pro Phe
                               1 5
ggg cac ctc gcc gac acc gtc tcc tgg gac tgc ggg gga ggc agc tgc 163
Gly His Leu Ala Asp Thr Val Ser Trp Asp Cys Gly Gly Gly Ser Cys
                               10 15 20
gcc acc aac gat ttg gta tcc ctg ttc atg ccg gcc gcc ttc atg agt 211
Ala Thr Asn Asp Leu Val Ser Leu Phe Met Pro Ala Ala Phe Met Ser
                               25 30 35
acc ctc gcc gcc tgc gta ttt ggc gcg tgg gcc ata ggt ttg atc gct 259
Thr Leu Ala Ala Cys Val Phe Gly Ala Trp Ala Ile Gly Leu Ile Ala
                               40 45 50
ccc gca cta ttc atc gcg gtg act gcc tgg gca ttt cgc tcc ggc gtg 307
Pro Ala Leu Phe Ile Ala Val Thr Ala Trp Ala Phe Arg Ser Gly Val
                               55 60 65
cag gct gcg att gcc gac ggc tac acg tcc gcg act tcc gtc ggc ttc 355
Gln Ala Ala Ile Ala Asp Gly Tyr Thr Ser Ala Thr Ser Val Gly Phe
                               70 75 80 85
gaa atg act gtc tgc ctc att ctt ttc atc atc gca ggt ctg tgc ttt 403
Glu Met Thr Val Ser Leu Ile Leu Phe Ile Ile Ala Gly Leu Cys Phe
                               90 95 100
ctg ggc tgg atc ccc atg ttc atc aac aac cgc caa gtc gcg cgc aag 451
Leu Gly Trp Ile Pro Met Phe Ile Asn Asn Arg Gln Val Ala Arg Lys
                               105 110 115
gtc cgc gag agg gct gcg ggc ttg agc aat taggctctcg cttttcgacg 501
Val Arg Glu Arg Ala Ala Gly Leu Ser Asn
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<213> Corynebacterium glutamicum

<400> 748

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Met Ser Asn Gln Leu
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ccc gat cac gtc cgc gac gcc ttc caa gta ggt gcg gga cct gcc gaa    163
Pro Asp His Val Arg Asp Ala Phe Gln Val Gly Ala Gly Pro Ala Glu
          10                      15                      20

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caa ctc ggt caa gct tgg gac ttc gga ttc cgc gtc ggc aac act gtg 211
Gln Leu Gly Gln Ala Trp Asp Phe Gly Phe Arg Val Gly Asn Thr Val
25 30 35

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ttc gcc aaa gtg acg gcg ccg gaa gtg tcg ggc tgg tcg tcg aaa acc    259
Phe Ala Lys Val Thr Ala Pro Glu Val Ser Gly Trp Ser Ser Lys Thr
          40                      45                      50

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cgc gaa acc ctg aaa cca gaa ggc gtg cgc gtc gta cga ccg atc cgc 307
 Arg Glu Thr Leu Lys Pro Glu Gly Val Arg Val Val Arg Pro Ile Arg
 55 60 65

tcc acc gac ggc cga ttt gtg gtt gcg ggg tgg cgc gca tcg gtg ttc 355
Ser Thr Asp Gly Arg Phe Val Val Ala Gly Trp Arg Ala Ser Val Phe
70 75 80 85

tct acg gga acg atc agc aag cga gtc gat gag acg gtc gtt gcg ggt 403
Ser Thr Gly Thr Ile Ser Lys Arg Val Asp Glu Thr Val Val Ala Gly
90 95 100

ctt cgt ttg gca gat gca tta gtg gat acg cat gca ccg qaa cct gtg 451

Overall		Male		Female	
Mean	SD	Mean	SD	Mean	SD
1.0	0.0	1.0	0.0	1.0	0.0
2.0	0.0	2.0	0.0	2.0	0.0
3.0	0.0	3.0	0.0	3.0	0.0
4.0	0.0	4.0	0.0	4.0	0.0
5.0	0.0	5.0	0.0	5.0	0.0
6.0	0.0	6.0	0.0	6.0	0.0
7.0	0.0	7.0	0.0	7.0	0.0
8.0	0.0	8.0	0.0	8.0	0.0
9.0	0.0	9.0	0.0	9.0	0.0
10.0	0.0	10.0	0.0	10.0	0.0
11.0	0.0	11.0	0.0	11.0	0.0
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18.0	0.0	18.0	0.0	18.0	0.0
19.0	0.0	19.0	0.0	19.0	0.0
20.0	0.0	20.0	0.0	20.0	0.0
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37.0	0.0	37.0	0.0	37.0	0.0
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41.0	0.0	41.0	0.0	41.0	0.0
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58.0	0.0	58.0	0.0	58.0	0.0
59.0	0.0	59.0	0.0	59.0	0.0
60.0	0.0	60.0	0.0	60.0	0.0
61.0	0.0	61.0	0.0	61.0	0.0
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Val Gly Asn Thr Val Phe Ala Lys Val Thr Ala Pro Glu Val Ser Gly
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Trp Ser Ser Lys Thr Arg Glu Thr Leu Lys Pro Glu Gly Val Arg Val
50 55 60

Val Arg Pro Ile Arg Ser Thr Asp Gly Arg Phe Val Val Ala Gly Trp
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Met Val Gly Ser Ser
1 5

ggt ttg cgg gta tcc agg ctc ggt ttg ggc acc tca aca tgg ggc tcg 163
Gly Leu Arg Val Ser Arg Leu Gly Leu Gly Thr Ser Thr Trp Gly Ser
10 15 20
.

ggc acc gag ctg gct gag gca ggc gat atc ttt aag gcg ttc atc aat 211
Gly Thr Glu Leu Ala Glu Ala Gly Asp Ile Phe Lys Ala Phe Ile Asn
25 30 35

tct ggt ggc acg ctt atc gac gtc tcc ccc aac tac acc acc ggc gtc 259
Ser Gly Gly Thr Leu Ile Asp Val Ser Pro Asn Tyr Thr Thr Gly Val

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40					45					50						
gcg	gaa	gaa	atg	ctc	ggc	acg	atg	ttg	gat	gcg	gaa	gtc	tct	cgt	tcg	307
Ala	Glu	Glu	Met	Leu	Gly	Thr	Met	Leu	Asp	Ala	Glu	Val	Ser	Arg	Ser	
55					60					65						
gct	gtc	gtc	att	tcc	tcc	agc	gca	ggg	gtc	aac	ccc	gct	ctg	ccg	ctc	355
Ala	Val	Val	Ile	Ser	Ser	Ser	Ala	Gly	Val	Asn	Pro	Ala	Leu	Pro	Leu	
70					75					80					85	
ggc	cga	cgt	gtg	gat	tgc	tcc	cgc	cgc	aat	ttg	att	gcc	caa	tta	gat	403
Gly	Arg	Arg	Val	Asp	Cys	Ser	Arg	Arg	Asn	Leu	Ile	Ala	Gln	Leu	Asp	
90					95					100						
gtc	acc	ctg	cgg	gca	tta	aac	act	gac	tat	ttg	gat	ttg	tgg	tct	gtg	451
Val	Thr	Leu	Arg	Ala	Leu	Asn	Thr	Asp	Tyr	Leu	Asp	Leu	Trp	Ser	Val	
105					110					115						
ggc	tat	tgg	gat	gag	ggc	acc	cca	ccg	cat	gag	gtg	gcc	gat	act	ttg	499
Gly	Tyr	Trp	Asp	Glu	Gly	Thr	Pro	Pro	His	Glu	Val	Ala	Asp	Thr	Leu	
120					125					130						
gat	tac	gcc	gtg	cgc	acc	ggc	cga	gtc	cga	tat	gcc	ggg	gtc	cga	gga	547
Asp	Tyr	Ala	Val	Arg	Thr	Gly	Arg	Val	Arg	Tyr	Ala	Gly	Val	Arg	Gly	
135					140					145						
tat	tcc	ggg	tgg	cag	tta	gcg	gtc	acc	cac	gct	gca	tcc	aat	cat	gca	595
Tyr	Ser	Gly	Trp	Gln	Leu	Ala	Val	Thr	His	Ala	Ala	Ser	Asn	His	Ala	
150					155					160					165	
gcg	gcc	tcc	gcc	cgc	ccc	gtg	gtc	gtt	gca	caa	aat	gaa	tac	agc	ctg	643
Ala	Ala	Ser	Ala	Arg	Pro	Val	Val	Val	Ala	Gln	Asn	Glu	Tyr	Ser	Leu	
170					175					180						
ctg	gaa	cgc	cgc	gca	gaa	caa	gaa	ctc	ctc	cct	gcc	acc	caa	cac	cta	691
Leu	Glu	Arg	Arg	Ala	Glu	Gln	Glu	Leu	Leu	Pro	Ala	Thr	Gln	His	Leu	
185					190					195						
ggg	gtc	gga	ttc	ttt	gct	ggc	gct	ccg	ctg	ggg	caa	ggc	gtg	ctg	act	739
Gly	Val	Gly	Phe	Phe	Ala	Gly	Ala	Pro	Leu	Gly	Gln	Gly	Val	Leu	Thr	
200					205					210						
gct	aaa	tac	cgc	tcc	gaa	att	ccc	cat	gat	tcc	aga	gct	gca	tcc	aca	787
Ala	Lys	Tyr	Arg	Ser	Glu	Ile	Pro	His	Asp	Ser	Arg	Ala	Ala	Ser	Thr	
215					220					225						
gga	cgc	gac	gca	gaa	gtc	caa	agc	tac	cta	gat	aat	cga	ggc	cgc	atc	835
Gly	Arg	Asp	Ala	Glu	Val	Gln	Ser	Tyr	Leu	Asp	Asn	Arg	Gly	Arg	Ile	
230					235					240					245	
att	gtc	gat	gct	ctt	gat	act	gca	gcc	aaa	gga	tta	ggc	att	agc	ccc	883
Ile	Val	Asp	Ala	Leu	Asp	Thr	Ala	Ala	Lys	Gly	Leu	Gly	Ile	Ser	Pro	
250					255					260						
gct	gtc	aca	gcc	acc	acc	tgg	gtg	cgt	gat	cgt	ccc	gga	gtg	aca	gct	931
Ala	Val	Thr	Ala	Thr	Thr	Trp	Val	Arg	Asp	Arg	Pro	Gly	Val	Thr	Ala	
265					270					275						
gtc	atc	gtg	ggc	gct	cgc	aca	cat	gaa	cag	ctg	tca	cat	ctt	ctc	aag	979
Val	Ile	Val	Gly	Ala	Arg	Thr	His	Glu	Gln	Leu	Ser	His	Leu	Leu	Lys	
280					285					290						

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gtc tcc ctg tgacttggtc caattacatt cac 1059
Val Ser Leu
310

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35 40 45

Glu Val Ser Arg Ser Ala Val Val Ile Ser Ser Ser Ala Gly Val Asn
65 70 75 80

Pro Ala Leu Pro Leu Gly Arg Arg Val Asp Cys Ser Arg Arg Asn Leu
85 90 95

Ile Ala Gln Leu Asp Val Thr Leu Arg Ala Leu Asn Thr Asp Tyr Leu
100 105 110

Asp Leu Trp Ser Val Gly Tyr Trp Asp Glu Gly Thr Pro Pro His Glu
115 120 125

Val Ala Asp Thr Leu Asp Tyr Ala Val Arg Thr Gly Arg Val Arg Tyr
130 135 140

Ala Gly Val Arg Gly Tyr Ser Gly Trp Gln Leu Ala Val Thr His Ala
145 150 155 160

Ala Ser Asn His Ala Ala Ala Ser Ala Arg Pro Val Val Val Ala Gln
165 170 175

Asn Glu Tyr Ser Leu Leu Glu Arg Arg Ala Glu Gln Glu Leu Leu Pro
180 185 190

Ala Thr Gln His Leu Gly Val Gly Phe Phe Ala Gly Ala Pro Leu Gly
195 200 205

Gln Gly Val Leu Thr Ala Lys Tyr Arg Ser Glu Ile Pro His Asp Ser
210 215 220

Arg Ala Ala Ser Thr Gly Arg Asp Ala Glu Val Gln Ser Tyr Leu Asp
225 230 235 240

[illegible]

att gcg gag ttt ttc gcg gga tca acc atg gtg aag tct ttt aac cac 499
Ile Ala Glu Phe Phe Ala Gly Ser Thr Met Val Lys Ser Phe Asn His
120 125 130

att ggt tat cac gag att gag cag gat gcg ggt acc ggg cgt gcg att 547
Ile Gly Tyr His Glu Ile Glu Gln Asp Ala Gly Thr Gly Arg Ala Ile
135 140 145

gcg tat gcc acg gat gat gtg gat gca ggt gcc cag gtt gca cag cta 595
Ala Tyr Ala Thr Asp Asp Val Asp Ala Gly Ala Gln Val Ala Gln Leu
150 155 160 165

att aag agt ttt ggg ttt gtt cct tta aat att ggc gca ttg gaa aac 643
Ile Lys Ser Phe Gly Phe Val Pro Leu Asn Ile Gly Ala Leu Glu Asn
170 175 180

ggc cgt att ctg gaa cct ggc caa gaa gct ttc ggc gcg cac ctt aat 691
Gly Arg Ile Leu Glu Pro Gly Gln Glu Ala Phe Gly Ala His Leu Asn
185 190 195

aaa gat tgc cgc cta gaa ctt gtt aat cag cgg tagtacctcg atcttcagcc 744
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200 205

aac 747

<210> 754

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<212> PRT

<213> Corynebacterium glutamicum

<400> 754

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Gly Ser Ser Leu Ala Arg Ser Ala Val Ala Ala Gly Tyr Glu Val Lys
20 25 30

Val Ala Gly Ser Gly Ala Val Asp Lys Ile Ala Leu Thr Ala Glu Ile
35 40 45

Leu Met Pro Gly Ala Val Pro Ser Thr Ala Asp Gln Ala Val Lys Asp
50 55 60

Ala Asp Ile Val Phe Leu Ala Val Pro Leu His Lys Phe Arg Ser Val
65 70 75 80

Asn Pro Ala Thr Leu Glu Gly Lys Ile Val Ile Asp Thr Met Asn His
85 90 95

Trp Val Pro Val Asn Gly Glu Leu Glu Glu Ile Asp Gln Asp Pro Arg
100 105 110

Ser Thr Ser Glu Ile Ile Ala Glu Phe Phe Ala Gly Ser Thr Met Val
115 120 125

Lys Ser Phe Asn His Ile Gly Tyr His Glu Ile Glu Gln Asp Ala Gly
130 135 140

Thr Gly Arg Ala Ile Ala Tyr Ala Thr Asp Asp Val Asp Ala Gly Ala

[illegible]

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ccgaacacgg gagagaacgc tgagcgttac aacactgtcc atg aag ggc gaa ttc																115
Met Lys Gly Glu Phe																5
1																
cac gcc ccc gat ttg gac aaa gaa ttt ttc ccg ggg cac gta acc gat																163
His Ala Pro Asp Leu Asp Lys Glu Phe Phe Pro Gly His Val Thr Asp																20
10 15																
agt ggt gaa gtc gtg aac atg ctg ttc acc gat ttc gct aat ggt tgg																211
Ser Gly Glu Val Val Asn Met Leu Phe Thr Asp Phe Ala Asn Gly Trp																35
25 30																
ttc gca atg gac cgc atc gta ttg atc cgt ctt ctt atg acg gca gtc																259
Phe Ala Met Asp Arg Ile Val Leu Ile Arg Leu Leu Met Thr Ala Val																50
40 45																
gtt gtg gtc ttc ttc ctt tgg gct atg cgc aag cca aag ctt gtt ccg																307
Val Val Val Phe Phe Leu Trp Ala Met Arg Lys Pro Lys Leu Val Pro																65
55 60																
cat ggc gtc cag aat ttt gca gag tac gca ctc gat ttc gtt ggt att																355
His Gly Val Gln Asn Phe Ala Glu Tyr Ala Leu Asp Phe Val Gly Ile																85
70 75 80																
cac atc gct gaa gac atc ctc gga aag aag aaa ggt cgt cgg ttc ctg																403
His Ile Ala Glu Asp Ile Leu Gly Lys Lys Lys Gly Arg Arg Phe Leu																95 100
90 95 100																
ccg atc ctg gcc acc atc ttc ttc gcg gct ctg ttg atg aac ctt gca																451
Pro Ile Leu Ala Thr Ile Phe Phe Ala Ala Leu Leu Met Asn Leu Ala																105 110 115
105 110 115																
acg atc atc ccg gga cta aac atc tcc tcc aac tca cgt att gca ttc																499

Thr Ile Ile Pro Gly Leu Asn Ile Ser Ser Asn Ser Arg Ile Ala Phe
 120 125 130
 cca atc gtg atg gcg gta gct ggt tac atc gcg ttt atc tac gca ggc 547
 Pro Ile Val Met Ala Val Ala Gly Tyr Ile Ala Phe Ile Tyr Ala Gly
 135 140 145
 tct aag cgt tac gga ttc ttc aaa tat gtg aag tct tct gtt gtg att 595
 Ser Lys Arg Tyr Gly Phe Phe Lys Tyr Val Lys Ser Ser Val Val Ile
 150 155 160 165
 ccg aac att cca cca gca ctt cac gtc ttg gtg gtt cca att gag ttc 643
 Pro Asn Ile Pro Pro Ala Leu His Val Leu Val Val Pro Ile Glu Phe
 170 175 180
 ttc tct aca ttc atc ttg agg cca gtc acc ctg gca ctg cgt ttg atg 691
 Phe Ser Thr Phe Ile Leu Arg Pro Val Thr Leu Ala Leu Arg Leu Met
 185 190 195
 gcc aac ttc ctt gct ggc cac atc atc ctg gtt ctg ctt ttc tcc gca 739
 Ala Asn Phe Leu Ala Gly His Ile Ile Leu Val Leu Leu Phe Ser Ala
 200 205 210
 acg aac ttc ttc ttc ttc cag ttc aac gga tgg aca gca atg tcc ggc 787
 Thr Asn Phe Phe Phe Phe Gln Phe Asn Gly Trp Thr Ala Met Ser Gly
 215 220 225
 gta acc atc ttg atg gca gta ctc ttc acg gtt tac gag atc att gtt 835
 Val Thr Ile Leu Met Ala Val Leu Phe Thr Val Tyr Glu Ile Ile Val
 230 235 240 245
 atc ttc ctg cag gca tac atc ttc gct ctg ctg gtc gct gta tac att 883
 Ile Phe Leu Gln Ala Tyr Ile Phe Ala Leu Leu Val Ala Val Tyr Ile
 250 255 260
 gag ctt tca ctt cac gcg gat tct cac tagatgaaaa aggtcgctat 930
 Glu Leu Ser Leu His Ala Asp Ser His
 265 270
 taa 933

<210> 756

<211> 270

<212> PRT

<213> Corynebacterium glutamicum

<400> 756

Met Lys Gly Glu Phe His Ala Pro Asp Leu Asp Lys Glu Phe Phe Pro
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Gly His Val Thr Asp Ser Gly Glu Val Val Asn Met Leu Phe Thr Asp
 20 25 30

Phe Ala Asn Gly Trp Phe Ala Met Asp Arg Ile Val Leu Ile Arg Leu
 35 40 45

Leu Met Thr Ala Val Val Val Val Phe Phe Leu Trp Ala Met Arg Lys
 50 55 60

Pro Lys Leu Val Pro His Gly Val Gln Asn Phe Ala Glu Tyr Ala Leu

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                                         Met Lys Gly Glu Phe
                                         1                     5

cac gcc ccc gat ttg gac aaa gaa ttt ttc ccg ggg cac gta acc gat 163
His Ala Pro Asp Leu Asp Lys Glu Phe Phe Pro Gly His Val Thr Asp
                     10                     15                     20

agt ggt gaa gtc qtq aac atq ctg ttc acc gat ttc gct aat ggt tqg 211

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<400> 758

<210> 759

<211> 1764

<212> DNA

<213> Corynebacterium glutamicum

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atc tcc tcc gat gag atc cgt agc gcg att gcg aac tac acc tcg agc 163
Ile Ser Ser Asp Glu Ile Arg Ser Ala Ile Ala Asn Tyr Thr Ser Ser
10 15 20

tac	tcc	gcg	gag	gcc	tcc	cgt	gag	gag	gtc	ggc	gtg	gtt	att	tcg	gcc	211
Tyr	Ser	Ala	Glu	Ala	Ser	Arg	Glu	Glu	Val	Gly	Val	Val	Ile	Ser	Ala	
		25					30						35			

gct gac ggt atc gcc cag gtt tcg ggc ctc ccg tca gta atg gcg aat 259
Ala Asp Gly Ile Ala Gln Val Ser Gly Leu Pro Ser Val Met Ala Asn
40 45 50

gag ctc ctc gaa ttc ccg ggc ggc gtc atc ggc gtc gca cag aac ctt 307
Glu Leu Leu Glu Phe Pro Gly Gly Val Ile Gly Val Ala Gln Asn Leu
55 60 65

gaa gct gac cga gtc ggc gtc gtg gtc ctg ggt aac tac gag cta ctt 355
Glu Ala Asp Arg Val Gly Val Val Val Leu Gly Asn Tyr Glu Leu Leu
70 75 80 85

aaa gaa ggc gac caa gtt cgt cgt act gga gac gtt ctg tct atc cca 403
Lys Glu Gly Asp Gln Val Arg Arg Thr Gly Asp Val Leu Ser Ile Pro
90 95 100

gtc ggc gag gca ttc ctt ggc cgc gtt atc aac ccc ctt ggc cag cca 451
Val Gly Glu Ala Phe Leu Gly Arg Val Ile Asn Pro Leu Gly Gln Pro
105 110 115

att gac ggc ctg ggc gaa att gca tcc gaa gag gac cgc gtc ctc gag 499
Ile Asp Gly Leu Gly Glu Ile Ala Ser Glu Glu Asp Arg Val Leu Glu
120 125 130

ctt cag gca cca acc gtg ctt gag cgc cag cct gtc gag gag cct ttg 547
 Leu Gln Ala Pro Thr Val Leu Glu Arg Gln Pro Val Glu Glu Pro Leu
 135 140 145

gca acc ggc atc aag gct atc gat gca atg acc cca atc ggc cgc ggt 595
Ala Thr Gly Ile Lys Ala Ile Asp Ala Met Thr Pro Ile Gly Arg Gly
150 155 160 165

cag cgt cag ctg atc att ggt gac cgt aag act ggc aag acc gca gtc 643
Gln Arg Gln Leu Ile Ile Gly Asp Arg Lys Thr Gly Lys Thr Ala Val
170 175 180

tgt gtc gat acc atc ctt aac cag aag gcc aac tgg gag acc ggc gac 691
Cys Val Asp Thr Ile Leu Asn Gln Lys Ala Asn Trp Glu Thr Gly Asp
185 190 195

aag acc aag cag gtt cgc tgc atc tac gtc gca atc ggt cag aag ggc 739
Lys Thr Lys Gln Val Arg Cys Ile Tyr Val Ala Ile Gly Gln Lys Gly
200 205 210

Figure 1 illustrates the steps of the proposed algorithm for finding a minimum spanning tree. The diagrams show a graph with 10 nodes and 15 edges, with some edges highlighted in red to indicate the current state of the algorithm. The steps are labeled (a) through (g).

<400> 761																
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Met Thr Thr Ala Leu																5
1																
gaa gag cag aac gca cag cag gca gcc act gcc ggc cgt gtc gtg cgt																163
Glu Glu Gln Asn Ala Gln Gln Ala Ala Thr Ala Gly Arg Val Val Arg																20
10 15																
gtc att ggt gcg gtc gtc gac gtg gag ttt ccc cgc ggc gag ctg cca																211
Val Ile Gly Ala Val Val Asp Val Glu Phe Pro Arg Gly Glu Leu Pro																35
25 30																
gca ctg tac aac gca ctt act gta gag gta acc ctc gaa tca gtt aag																259
Ala Leu Tyr Asn Ala Leu Thr Val Glu Val Thr Leu Glu Ser Val Lys																50
40 45																
aag acc gtt gtt ctc gag gtt gct cag cac ctc ggc gac aac ctc atc																307
Lys Thr Val Val Leu Glu Val Ala Gln His Leu Gly Asp Asn Leu Ile																65
55 60																
cgc acc atc gct atg gca cca acc gac gga ctt gtc cgc ggt gct gct																355
Arg Thr Ile Ala Met Ala Pro Thr Asp Gly Leu Val Arg Gly Ala Ala																85
70 75 80																
gta acc gat act gca cgc cca att tcc gta cca gtg ggc gat gtt gtt																403
Val Thr Asp Thr Ala Arg Pro Ile Ser Val Pro Val Gly Asp Val Val																100
90 95																
aag ggc cac gta ttc aac gct ttg ggc gac tgc cta gac gac gtt tcc																451
Lys Gly His Val Phe Asn Ala Leu Gly Asp Cys Leu Asp Asp Val Ser																115
105 110																

[illegible]

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<211> 739
<212> DNA
<213> *Corynebacterium glutamicum*

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<222> (101)..(739)
<223> FRXA01203
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Met Thr Thr Ala Leu																
1 5																
gaa gag cag aac gca cag cag gca gcc act gcc ggc cgt gtc gtg cgt																163
Glu Glu Gln Asn Ala Gln Gln Ala Ala Thr Ala Gly Arg Val Val Arg																
10 15 20																
gtc att ggt gcg gtc gtc gac gtg gag ttt ccc cgc ggc gag ctg cca																211
Val Ile Gly Ala Val Val Asp Val Glu Phe Pro Arg Gly Glu Leu Pro																
25 30 35																
gca ctg tac aac gca ctt act gta gag gta acc ctc gaa tca gtt aag																259
Ala Leu Tyr Asn Ala Leu Thr Val Glu Val Thr Leu Glu Ser Val Lys																
40 45 50																
aag acc gtt gtt ctc gag gtt gct cag cac ctc ggc gac aac ctc atc																307
Lys Thr Val Val Leu Glu Val Ala Gln His Leu Gly Asp Asn Leu Ile																
55 60 65																
cgc acc atc gct atg gca cca acc gac gga ctt gtc cgc ggt gct gct																355
Arg Thr Ile Ala Met Ala Pro Thr Asp Gly Leu Val Arg Gly Ala Ala																
70 75 80 85																

gta acc gat act gca cgc cca att tcc gta cca gtg ggc gat gtt gtt 403
 Val Thr Asp Thr Ala Arg Pro Ile Ser Val Pro Val Gly Asp Val Val
 90 95 100

aag ggc cac gta ttc aac gct ttg ggc gac tgc cta gac gac gtt tcc 451
 Lys Gly His Val Phe Asn Ala Leu Gly Asp Cys Leu Asp Asp Val Ser
 105 110 115

ctg aac aac aac cca gag atc gag cgt tgg ggc atc cac cgc gag cca 499
 Leu Asn Asn Asn Pro Glu Ile Glu Arg Trp Gly Ile His Arg Glu Pro
 120 125 130

cca tca ttc gat cag ctt gag ggt aag acc gag atc ctg gaa aca ggc 547
 Pro Ser Phe Asp Gln Leu Glu Gly Lys Thr Glu Ile Leu Glu Thr Gly
 135 140 145

atc aag gtt atc gac ctt ctc acc cct tac gtt aag ggt gga aag atc 595
 Ile Lys Val Ile Asp Leu Leu Thr Pro Tyr Val Lys Gly Gly Lys Ile
 150 155 160 165

ggc ctc ttc ggt ggt gca ggt gtg ggt aag acc gtt ctt atc cag gaa 643
 Gly Leu Phe Gly Gly Ala Gly Val Gly Lys Thr Val Leu Ile Gln Glu
 170 175 180

atg atc acc cgt att gca cgt gag ttc tcc ggt act tcc gtg ttc gca 691
 Met Ile Thr Arg Ile Ala Arg Glu Phe Ser Gly Thr Ser Val Phe Ala
 185 190 195

ggt gtt ggt aag cgt acc cgt gag ggc acc gac ctc ttc ctc gaa atg 739
 Gly Val Gly Lys Arg Thr Arg Glu Gly Thr Asp Leu Phe Leu Glu Met
 200 205 210

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 20 25 30

Arg Gly Glu Leu Pro Ala Leu Tyr Asn Ala Leu Thr Val Glu Val Thr
 35 40 45

Leu Glu Ser Val Lys Lys Thr Val Val Leu Glu Val Ala Gln His Leu
 50 55 60

Gly Asp Asn Leu Ile Arg Thr Ile Ala Met Ala Pro Thr Asp Gly Leu
 65 70 75 80

Val Arg Gly Ala Ala Val Thr Asp Thr Ala Arg Pro Ile Ser Val Pro
 85 90 95

Val Gly Asp Val Val Lys Gly His Val Phe Asn Ala Leu Gly Asp Cys
 100 105 110

Leu Asp Asp Val Ser Leu Asn Asn Asn Pro Glu Ile Glu Arg Trp Gly

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Glu Leu Gln Gly Arg Ser Val Ala His Val Val Thr Ala Val Glu Leu
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 aac gag gga cag caa caa gcg cta gct gaa aag ctg gga cgt att tat 480
 Asn Glu Gly Gln Gln Gln Ala Leu Ala Glu Lys Leu Gly Arg Ile Tyr
 145 150 155 160
 ggt cgt gcg atg agc atc cac tcc gag gtt gat acc agc ctc ctc ggt 528
 Gly Arg Ala Met Ser Ile His Ser Glu Val Asp Thr Ser Leu Leu Gly
 165 170 175
 gga atg atc atc cgc gtc gga gac gaa gta att gac ggc agc acc tcg 576
 Gly Met Ile Ile Arg Val Gly Asp Glu Val Ile Asp Gly Ser Thr Ser
 180 185 190
 ggc aaa ctc gag cgt ctg cgg gca agc ttc gca taaagacacg acgaattaga 629
 Gly Lys Leu Glu Arg Leu Arg Ala Ser Phe Ala
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 caa 632

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 35 40 45
 Gly Gln Leu Gly Gln Val Glu Asp Glu Leu Phe Arg Leu Ser Arg Ile
 50 55 60
 Leu Asp Arg Glu Ser Lys Leu Thr Gln Leu Leu Ser Asp Arg Thr Gln
 65 70 75 80
 Glu Ile Gly Gly Arg Arg Asp Leu Leu Ala Lys Val Leu Tyr Gly Lys
 85 90 95
 Val Thr Ala Val Thr Glu Ala Leu Ala Leu Gln Ala Ile Gly Arg Pro
 100 105 110
 Glu His Asn Pro Ile Asp Asp Ile Ala Ala Leu Ala Gly Ala Val Ala
 115 120 125
 Glu Leu Gln Gly Arg Ser Val Ala His Val Val Thr Ala Val Glu Leu
 130 135 140
 Asn Glu Gly Gln Gln Gln Ala Leu Ala Glu Lys Leu Gly Arg Ile Tyr
 145 150 155 160
 Gly Arg Ala Met Ser Ile His Ser Glu Val Asp Thr Ser Leu Leu Gly
 165 170 175

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Gly Asp Ile Ala Gly Leu Ile Gly Glu Asn Gly Ala Gly Lys Ser Thr
 35 40 45
 Leu Leu Ser Leu Ile Ala Gly Val Met Glu Pro Asp Gln Gly Arg Ile
 50 55 60
 Tyr Leu Pro Glu Arg Thr Gly Phe Ile Ala Gln Glu Thr Asp Leu Pro
 65 70 75 80
 Phe Glu Gln Pro Val Gln Ser Leu Ile Asp Ala Ala Val Ala Pro Val
 85 90 95
 Arg Ala Val Asp Ala Ala Ile Thr Asp Leu Ser Thr Lys Leu Gly Asp
 100 105 110
 Ala Ser Leu Ser Ala Glu Glu Gln Ala Gln Val Ala Thr Asp Phe Asp
 115 120 125
 Ala Ala Leu Gly Ala Ala Glu Glu Leu Gly Leu Trp Glu Leu Asp Ala
 130 135 140
 Arg Ile Glu Thr Ile Val Ala Gly Leu Gly Leu Ala Glu Val Asp Arg
 145 150 155 160
 Ser Thr Pro Ile Gly Glu Leu Ser Gly Gly Gln Arg Arg Arg Phe Ala
 165 170 175
 Leu Ala Ala Leu Leu Leu Glu Pro His Asp Ala Leu Ile Phe Asp Glu
 180 185 190
 Pro Thr Asn His Leu Asp Asp Thr Ala Val Asp Phe Leu Ile Ser Glu
 195 200 205
 Ile Ser Arg Phe Lys Gly Pro Val Leu Ile Ala Ser His Asp Arg Phe
 210 215 220
 Phe Leu Asp Ser Val Cys Thr Glu Leu Ile Asp Leu Asp Pro Ala Leu
 225 230 235 240
 Gly Pro Glu Gly Gly Ser Gly Glu Glu Val Lys Gln Ala Val Ser Phe
 245 250 255
 Gly Gly Gly Phe Ser Glu Tyr Ile Lys Glu Arg Glu Thr Arg Arg Thr
 260 265 270
 Arg Trp Ala Gln Leu Tyr Thr Ala Gln Glu Thr Glu Arg Glu Lys Leu
 275 280 285
 Glu Glu Thr Thr Gly Thr Thr Glu Ser Asp Ile Phe His Ser Ser Val
 290 295 300
 Ser Lys Ser Glu Ala Lys Ile Thr Ala Lys Phe Tyr Ala Asp Arg Ala
 305 310 315 320
 Ala Lys Thr Gln Gly Asn Arg Val Arg Ser Ala Lys Asn Arg Leu Lys
 325 330 335
 Glu Leu Glu Arg Tyr Glu Ile Pro Ala Pro Pro Lys Pro Leu Glu Phe
 340 345 350

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Asp Asp Ile Lys Thr Thr Phe Asp Asp Trp Glu Thr Phe Ser Ser Glu
 65 70 75 80
 Asn Ala Gln Ala Pro Val Arg Lys Arg Gly Pro Gln Ala Thr Gln Ile
 85 90 95
 Met Thr Asp Gly Gly Phe Thr Ala Tyr Ser Gly Leu Ser Ala Arg Ile
 100 105 110
 Pro Pro Glu His Thr Arg Ile Arg Ala Ile Ala Gln Lys Ala Phe Thr
 115 120 125
 Pro Arg Arg Tyr Lys Ala Leu Glu Pro Asp Ile Arg Ala Met Val Ile
 130 135 140
 Asp Arg Val Glu Lys Met Leu Ala Asn Asp Gln His Val Gly Asp Met
 145 150 155 160
 Val Ser Asp Leu Ala Tyr Asp Ile Pro Thr Ile Thr Ile Leu Thr Leu
 165 170 175
 Ile Gly Ala Asp Ile Phe Met Val Val Thr Tyr Lys Arg Trp Ser Asp
 180 185 190
 Ser Arg Ala Ala Met Thr Trp Gly Asp Leu Ser Asp Glu Glu Gln Ile
 195 200 205
 Pro His Ala His Asn Leu Val Glu Tyr Trp Gln Glu Cys Gln Arg Met
 210 215 220
 Val Ala Asp Ala His Ala His Gly Gly Asp Asn Leu Thr Ala Asp Leu
 225 230 235 240
 Val Arg Ala Gln Gln Glu Gly Gln Glu Ile Thr Asp His Glu Ile Ala
 245 250 255
 Ser Leu Leu Tyr Ser Leu Leu Phe Ala Gly His Glu Thr Thr Thr Thr
 260 265 270
 Leu Ile Ser Asn Cys Phe Arg Val Leu Leu Asp His Pro Glu Gln Trp
 275 280 285
 Gln Ala Ile Leu Glu Asn Pro Lys Leu Ile Pro Ala Ala Val Asp Glu
 290 295 300
 Val Leu Arg Tyr Ser Gly Ser Ile Val Gly Trp Arg Arg Lys Ala Leu
 305 310 315 320
 Lys Asp Thr Glu Ile Gly Gly Val Ala Ile Lys Glu Gly Asp Gly Val
 325 330 335
 Leu Leu Leu Met Gly Ser Ala Asn Arg Asp Glu Ala Arg Phe Glu Asn
 340 345 350
 Gly Glu Glu Phe Asp Ile Ser Arg Ala Asn Ala Arg Glu His Leu Ser
 355 360 365
 Phe Gly Phe Gly Ile His Tyr Cys Leu Gly Asn Met Leu Ala Lys Leu
 370 375 380

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85																90				95			
Gln	Asn	Gln	Leu 100	Ala	Ile	Gln	Gly	Leu 105	Phe	Ala	Pro	Thr	Ala 110	Glu	Trp								
Glu	Gly	Asp 115	Asn	Asn	Glu	Leu	Leu 120	Thr	Ser	Ser	Tyr	Pro 125	Ala	Met	Arg								
Asp	Pro 130	Ala	Val	Ala	Ile	Asp 135	Ile	Tyr	Arg	Gly	Asp 140	Asn	Gly	Leu	Asp								
Thr 145	Gly	Ile	Gly	Gln	Ser 150	Leu	Phe	Ser	Leu	Asp 155	Ser	Ser	Leu	Met	His 160								
Ser	Gly	Val	Leu	Gln 165	Lys	Ile	Glu	Arg	Val 170	Asn	Leu	Gln	Ile	Gly 175	Asp								
Thr	Val	Thr	Leu 180	Asp	Asp	Gly	Thr	Thr 185	Val	Ser	Phe	Asp	Gly 190	Ala	Ser								
Glu	Phe 195	Ala	Asn	Tyr	Gln	Ile	Ser 200	Arg	Asp	Pro	Thr	Gln 205	Asn	Trp	Val								
Leu 210	Val	Thr	Thr	Val	Ile	Ser 215	Leu	Val	Ser	Leu	Val 220	Gly	Ser	Leu	Met								
Ile 225	Arg	Arg	Arg	Arg	Ile 230	Trp	Val	Arg	Phe	Tyr 235	Pro	Gln	Glu	Asn	Gly 240								
Thr	Thr	Arg	Val	Glu 245	Thr	Gly	Gly	Leu	Ala 250	Arg	Thr	Asp	Arg	Ala 255	Gly								
Trp	Gly	Gly	Glu 260	Tyr	Glu	Lys	Phe	His 265	Arg	Glu	Leu	Leu	Gly 270	Leu	Lys								
Glu	Glu	Asp 275	Glu	Asp	Glu	Glu	Tyr 280	Phe	Asp	His	Asp	Asp 285											